Monitoring liver elasticity: a new tool to measure liver fibrosis during therapy.

B. Coco, F. Oliveri, P. Colombatto, P. Ciccorossi, R. Sacco, F. Bonino and M.R. Brunetto
U.O. Gastroenterologia ed Epatologia, Azienda Ospedaliera Universitaria Pisana, Pisa;
# Direzione Scientifica Ospedale Maggiore IRCCS, Milano - ITALY

Background: Hepatic fibrosis is the major indicator of progressive liver diseases, being in the single patients, the best predictive factor of unfavourable outcome. Therefore, the evaluation of fibrosis degree has relevant prognostic implications and is one of the most important parameters to be considered in treatment decision flow chart. In addition, the primary objective of antithrombotic therapy is to block progression of fibrosis and this has been shown possible by recent studies, the monitoring of fibrosis during and after therapy became an important parameter to evidence treatment efficacy.

Liver biopsy is the "gold standard" for liver fibrosis assessment. However, it is an invasive procedure, which can be affected by sampling errors, inter and intraobserver variability and is unsuitable for short term monitoring of disease progression.

To overcome these limits, in the last years several methods of measurement of hepatic fibrosis and detection of cirrhosis in a cohort of patients with chronic hepatitis.

Patients and methods: We studied liver elastometry (Fibroscan(TM)) in 241 patients with chronic hepatitis B or C, observed at our Unit (Pisa, Italy) from April to December 2004.
- A liver biopsy was performed within 12 months in all patients with ultrasound (US) signs of cirrhosis. Non-invasive activity and fibrosis were evaluated according to METAVIR scoring system. Biopsies were classified in a semiquantitative way: absent (<5%); mild-moderate (5-60%); severe (>60%).
- Liver biopsy site from 5 mm length were considered unsuitable for fibrosis staging.
- Liver stiffness measurement was performed on the right lobe, through an interfascial space access, using an ultrasound guide to detect a liver portion of at least 6 cm thick without vascular structure. The rate of successful measurement was calculated as the ratio between the number of validated and total measurement. The results were expressed in KiloPascal (Kpa).

RESULTS:

FIBROSCAN PERFORMANCE

Table 1. Characteristics of analysed patients

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean age (range)</th>
<th>HBSAg</th>
<th>HCV infection</th>
<th>Collagen 12/24</th>
<th>Alcohol</th>
<th>Glucidic dysm.</th>
<th>Hypertension</th>
<th>Iron overload</th>
<th>BMI</th>
<th>NAFLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>M/F</td>
<td>162/85</td>
<td>50.4 (20-77)</td>
<td>79/149</td>
<td>98/228 (41.2%)</td>
<td>24</td>
<td>13</td>
<td>9</td>
<td>17</td>
<td>30</td>
</tr>
</tbody>
</table>
| Liver histology was performed in 159 patients (69.7%), as the remaining 69 patients using Fibroscan value < 14 Kpa.

To evaluate the diagnostic accuracy of liver elastometry by Fibroscan we proposed to predict the histological severity of chronic liver disease.

To overcome these limits, in the last years several methods of measurement of hepatic fibrosis and detection of cirrhosis in a cohort of patients with chronic hepatitis.

Patients and methods:

We studied liver elastometry (Fibroscan(TM)) in 241 patients with chronic hepatitis B or C, observed at our Unit (Pisa, Italy) from April to December 2004.

- A liver biopsy was performed within 12 months in all patients with ultrasound (US) signs of cirrhosis. Non-invasive activity and fibrosis were evaluated according to METAVIR scoring system. Biopsies were classified in a semiquantitative way: absent (<5%); mild-moderate (5-60%); severe (>60%).
- Liver biopsy site from 5 mm length were considered unsuitable for fibrosis staging.

Liver stiffness measurement was performed on the right lobe, through an interfascial space access, using an ultrasound guide to detect a liver portion of at least 6 cm thick without vascular structure. The rate of successful measurement was calculated as the ratio between the number of validated and total measurement. The results were expressed in KiloPascal (Kpa).

The results were expressed in KiloPascal (Kpa).

To evaluate accuracy to detection of Cirrhosis in all 228 patients using Fibroscan value < 14 Kpas.

Table 3A. Diagnostic accuracy to detection of Cirrhosis in all 228 patients using Fibroscan value < 14 Kpas

<table>
<thead>
<tr>
<th>Fibroscan value (Kpa)</th>
<th>Cirrhosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 14</td>
<td>111 (60.2%)</td>
</tr>
<tr>
<td>≥ 14</td>
<td>2 (2.4%)</td>
</tr>
</tbody>
</table>

Role of active disease in liver elastometry value:

In order to explain the unexpected higher DA of Fibroscan to detect liver cirrhosis in patients without other clinical signs of cirrhosis, we evaluate the role of disease activity.

We observed that patients with inactive disease had a lower Fibroscan value (p < 0.001) than patients with active disease.

Conclusions:

Liver elastometry by Fibroscan is a new tool for non invasive evaluation of liver fibrosis with good reproducibility.

Comparison of Liver elastometry to alogorithm to detect liver (Fibroscan) values significantly lower than patients with active disease.

Our method has a high diagnostic accuracy.

We observed that patients with inactive disease had a lower Fibroscan value (p < 0.001) than patients with active disease.

Conclusions:

Liver elastometry by Fibroscan is a new tool for non invasive evaluation of liver fibrosis with good reproducibility.

Comparison of Liver elastometry to alogorithm to detect liver (Fibroscan) values significantly lower than patients with active disease.

Our method has a high diagnostic accuracy.

We observed that patients with inactive disease had a lower Fibroscan value (p < 0.001) than patients with active disease.