Evaluating hepatitis C core antigen as a screening test in populations at high risk of hepatitis C (HCV) infection

Vora NV1,2, Houlihan C3,4, Nastouli E3,5, Gilson R1,2, Nugent D1,2, Ghosh I2, Waters L2

1. Centre for Clinical Research in Infection and Sexual Health, Institute for Global Health, University College London
3. London School of Hygiene and Tropical Medicine; 5. Great Ormond Street Hospital, London, UCL

Background

• There is a sustained epidemic of HCV infection among MSM, particularly HIV positive MSM1; high rates of reinfection have been reported2.
• Screening high-risk populations using antibody (anti-HCV) does not discriminate active from resolved infections.
• Anti-HCV may be negative in early infection and remain negative for longer in people with HIV infection3.
• Use of HCV RNA for screening is expensive.
• HCV core antigen (HCVAg) is validated for screening in HIV-negative patients at high risk of HCV, e.g. those on haemodialysis4 but data in people with HIV is lacking.
• We evaluated the use of Architect HCV Ag Assay (Abbott Diagnostics) for HCV screening in high risk HIV-positive and HIV-negative individuals.

Methods

• HCVAg testing was introduced in May 2015 at our centre for HIV-positive patients reporting recent HCV risk (previous 6 months) and for annual screening.
• During a 9 month evaluation phase, both HCVAg and HCV RNA were tested to determine the sensitivity and specificity of HCVAg relative to RNA as gold standard.
• Post-evaluation, HCVAg was introduced for screening all high-risk individuals, regardless of HIV status.
• Anti-HCV tests were performed on HCVAg &/or RNA+ samples to determine how many HCV infections would have been missed if anti-HCV alone was used for screening.

Results

• 399 samples were tested for HCV Ag and RNA tests; 308 were from HIV-positive individuals.

<table>
<thead>
<tr>
<th>HCVAg</th>
<th>Overall (95% CI)</th>
<th>HIV-positive (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RNA+</td>
<td>RNA-</td>
</tr>
<tr>
<td>Ag+</td>
<td>181</td>
<td>84</td>
</tr>
<tr>
<td>Ag-</td>
<td>7</td>
<td>127</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
<td>211</td>
</tr>
</tbody>
</table>

Sensitivity, specificity and predictive values:

<table>
<thead>
<tr>
<th>HCVAg</th>
<th>Sensitivity (92.5-98.5)</th>
<th>Specificity (52.5-68.1)</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCVAg</td>
<td>96.3%</td>
<td>60.2%</td>
<td>68.3%</td>
<td>94.8%</td>
</tr>
</tbody>
</table>

PPV = positive predictive value; NPV = negative predictive value

• Sensitivity and specificity were unaffected by HIV status (p=0.65).

Conclusions

• Screening for HCV with HCVAg or RNA leads to earlier diagnosis of acute hepatitis C in high risk individuals.
• The specificity of HCVAg was lower (60.2%) than published (98.8% in one meta-analysis); false positives were identified by HCV RNA testing of all HCVAg positive samples.
• NPV remains high including within our HIV positive at risk cohort.
• HCVAg correctly identified our small number of reinfections.
• HCVAg remains significantly cheaper (£7 vs £52) than HCV RNA for screening at risk populations.

References