False positive HBsAg resulting from routine HBV vaccination prior to initiating HIV pre-exposure prophylaxis

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Background

• Pre-exposure prophylaxis (PrEP) is an effective strategy for HIV prevention
• Hepatitis B virus (HBV) serostatus must be known prior to PrEP initiation as PrEP medications have activity against HBV
• HBV vaccination is recommended for susceptible individuals
• HBV surface antigen (HBsAg) can be detected shortly after vaccination leading to misdiagnosis of acute or chronic HBV
• Two cases of vaccine induced HBsAg detection following routine evaluation for PrEP and HBV vaccination are presented herein

Case 1

• 34 year old male, referred for PrEP
• No prior HBV vaccination, first vaccine dose given after initial PrEP evaluation
• Baseline bloodwork 5 days later revealed positive HBsAg suggesting acute or chronic HBV infection (Table 1)
• Repeat bloodwork revealed HBV vaccine induced seroconversion, with negative HBsAg (Table 1)
• PrEP was initiated following specialist consultation after 10 months as the patient was initially lost to follow up for several months

Case 2

• 54 year old male, referred for PrEP
• No prior HBV vaccination, first vaccine dose given after initial PrEP evaluation
• Baseline bloodwork 3 days later revealed positive HBsAg suggesting acute or chronic HBV infection (Table 2)
• 10 days later, repeat bloodwork revealed HBV vaccine induced seroconversion, with negative HBsAg (Table 2)
• PrEP was initiated following specialist consultation, but delayed 24 days

Table 1

<table>
<thead>
<tr>
<th>Days after vaccine</th>
<th>HBsAg</th>
<th>Anti-HBs Ab (IU/mL)</th>
<th>Anti-HBc Ab</th>
<th>HBV DNA (IU/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 5</td>
<td>Positive</td>
<td>&lt; 2.0</td>
<td>Non-reactive</td>
<td>-</td>
</tr>
<tr>
<td>Day 34</td>
<td>Non-reactive</td>
<td>-</td>
<td>Non-reactive</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>Day 322</td>
<td>Non-reactive</td>
<td>&gt; 1000</td>
<td>Non-reactive</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Days after vaccine</th>
<th>HBsAg</th>
<th>Anti-HBs Ab (IU/mL)</th>
<th>Anti-HBc Ab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 3</td>
<td>Positive (1.42; 2.09)*</td>
<td>&lt; 3.1</td>
<td>Non-reactive</td>
</tr>
<tr>
<td>Day 13</td>
<td>Non-reactive</td>
<td>82</td>
<td>Non-reactive</td>
</tr>
</tbody>
</table>

*Signal strength, run in duplicate

Discussion

• Low level HBsAg can be detected for 2-3 weeks following HBV vaccination
• HBV markers measured within this window can mimic acute or chronic HBV
• Implications include:
  ➢ Misdiagnosis of HBV
  ➢ Unnecessary patient distress
  ➢ Additional laboratory testing
  ➢ Specialist referral
  ➢ Delayed, deferred, or missed opportunity to start PrEP

Conclusions

• PrEP prescribers should be aware that vaccine induced HBsAg can be detected 2-3 weeks after HBV vaccination
• PrEP clinics require structured work flow to ensure HBV serostatus is measured prior to HBV vaccination to reduce false clinical diagnoses of acute or chronic HBV