Improperly Used Insulin Pen Lookback Investigation in Veterans Affairs (VA) Medical Center

Patricia Schirmer MD1,4, Cynthia Lucero-Obusan MD1,2, Mark Winters MS3,4, Gina Oda MS4,2, Richard A. Martellino MD1,3, Victoria Devoy PhD, MPH2,4, Mark Holodny MD1,2,7

Department of Veterans Affairs Affairs – Office of Public Health, Washington, DC; VHA Office of Public Health Surveillance and Research, Palo Alto, CA; Stanford University, Stanford, CA; VA Palo Alto Health Care System, Palo Alto, CA; Yale School of Medicine, New Haven, CT; VHA Office of Research and Development, Washington, DC; Stanford University, Division of Infectious Diseases & Geographic Medicine, Palo Alto, CA

Introduction

Insulin pens are a combined syringe and insulin system originally developed for outpatient use due to portability and ease of use. Insulin pens are designed to be used multiple times, for a single person only, using a new needle for each injection. Given the potential for backflow of the patient’s blood into the pen after injection, insulin pens should not be shared among patients. Therefore, if pens are reused among multiple patients, there is potential risk for bloodborne pathogen (BBP) transmission, even when the needle is changed. Improper use of insulin pens has been reported in multiple hospitals. In 2009, U.S. FDA issued a safety alert indicating that insulin pens are for single use patient only¹.

We performed a lookback investigation to identify possible bloodborne pathogen transmission at one VA facility where insulin pens in the inpatient setting were not dedicated to individual patients, although staff reported changing needles between patients.

We would like to thank all of the staff at the facility that assisted with the lookback investigation.

Methods

Inpatients receiving insulin from Lantus® SoloSTAR® pens from 10/19/2010-11/12/2012 were identified by the facility and VA Corporate Data Warehouse using bar coded medication administration data. Identified patients were offered hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV) testing which included HBV surface antigen/antibody, HBV core antibody, HCV viral load (if indicated), and HIV antibody and viral load (if indicated). Results of post-exposure testing were reviewed, along with any previous viral testing history (assessed by chart review), to identify non-related patients (Figures 1/2 and Tables 2/3). Sequences in Genotype 1a Patients. Sequences in Genotype 1b Patients.

Results

Table 1. HIBV, HICV Test Results for Exposure Cohort

<table>
<thead>
<tr>
<th>Test</th>
<th>Positive</th>
<th>Total</th>
<th>Positive %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIBV</td>
<td>0</td>
<td>718</td>
<td>0</td>
</tr>
<tr>
<td>HICV</td>
<td>0</td>
<td>718</td>
<td>0</td>
</tr>
</tbody>
</table>

*Includes deceased patients, lost to follow-up or refused testing.

No newly identified HIV positive patients were found.

Newly identified HCV positive patients from the site and 4 epidemiologically non-related patients (Figures 1/2 and Tables 2/3). No linkage between HCV strains was identified.

Newly identified as serologically HBV positive, but none had HBV DNA viremia.

Sequences in Genotype 1a Patients. Sequences in Genotype 1b Patients.

Figure 1. Genomic Fingerprinting of genotype 1a HCV infected patients

Figure 2. Genomic Fingerprinting of genotype 1b HCV infected patients

Figure 3. Phylogenetic tree of genotype 1a HCV E1/E2 sequences. Single genome sequences (average of 20 sequences per sample, range 10-24 sequences) were aligned with MUSCLE, and a neighbor-joining tree was created using Geneious, employing a Jukes-Cantor distance model with 1000 bootstrap replications. Scale bar represents percent nucleotide variability.

No linkage between HCV strains was identified.

No evidence of HIV, HBV or HCV transmission was identified with improper reuse of insulin pens at this VA facility. In response to this event, VA created a national Patient Safety Alert and multi-dose pen injectors are no longer routinely used on all patient care units in VA.

Newly found to be infected patient sequences (B12) are shaded. ENR=epidemiologically non-related patient.


disclosure: The views expressed in this poster are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government. Disclaimer: The views expressed in this poster are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

Conclusion

LIMITATIONS

Unable to obtain samples and/or perform complete testing on all patients

Sample was not uniformly sampled on all patients so additional testing could not be performed in all cases where indicated

Insulin pens in question were not available to test for evidence of BBP

REFERENCES


