CENTRAL LINE ASSOCIATED BLOODSTREAM INFECTION AND BLOOD DRAWING PRACTICES IN AN ADULT HOME PARENTERAL NUTRITION POPULATION WITH TUNNELED CATHETERS

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INTRODUCTION

- Long term Home Parenteral Nutrition (HPN) is often administered through a tunneled central venous catheter (CVC)

- A significant complication of HPN is Central Line Associated Bloodstream Infection (CLABSI)
Lab Monitoring

- Necessary for safe management of HPN

- Blood is collected from peripheral venipuncture (PV) or CVC lumen
TUNNELED CVC BLOOD DRAWS

- CVC blood draws are chosen when:
  - Poor peripheral venous access
  - Needle phobia
  - Excessive pain with venipuncture
  - Patient convenience

- CVC blood may be drawn in the home, outpatient clinic, or MD office

- CVC blood may be drawn by the patient, family caregiver, home health nurse, office/clinic nurse
AIM OF STUDY

- Compare CLABSI rates between CVC blood draw and peripheral venipuncture

- Compare CLABSI rates associated with the person drawing the CVC blood
Methods

- **Data collection period** January 2005 – December 2013

- Retrospective data collected by medical record review

- Adult HPN patients with tunneled CVC in place for at least 720 CVC days

- One home infusion pharmacy
METHODS

- Demographic data
  - Age
  - Sex
  - Diagnosis
  - Infusion days per week
- Total and individual CVC days
- Corresponding CLABSI incidents per 1000 CVC days
  - Defined as presence of symptoms, positive blood cultures by peripheral and/or CVC sample
  - Same organism cultured within 30 days counted as same episode
- 2 Groups established
  - Venipuncture = 68 patients
  - CVC draw = 40 patients
    - Self
    - Clinic/MD Office
    - Home Health Nurse
    - Family Caregiver
RESULTS
TOTAL POPULATION

- Total number of patients  n=108
- Tunneled CVC days = 278,635
- CLABSI n=210
- CLABSI Rate = 0.75/1000 CVC days
# Results

## Demographics

<table>
<thead>
<tr>
<th>Group</th>
<th>Age</th>
<th>Sex (Female)</th>
<th>HPN Days/Wk</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV = 68</td>
<td>59 (29-86)</td>
<td>63%</td>
<td>6-7 = 82.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4-5 = 17.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;4 = 0.0%</td>
</tr>
<tr>
<td>CVC = 40</td>
<td>56 (23-89)</td>
<td>80%</td>
<td>6-7 = 78%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4-5 = 17.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt; 4 = 4.4%</td>
</tr>
</tbody>
</table>
# RESULTS

## CLABSI

<table>
<thead>
<tr>
<th>Group</th>
<th>CLABSI Incidents</th>
<th>CVC days</th>
<th>CLSBSI Rate/1000 CVC Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV = 68</td>
<td>118</td>
<td>181,650</td>
<td>0.65/1000 Range: 0/1000 -3.2/1000</td>
</tr>
<tr>
<td>CVC = 40</td>
<td>92</td>
<td>96,985</td>
<td>0.95/1000 Range: 0/1000-6.7/1000</td>
</tr>
</tbody>
</table>
## RESULTS
### CVC DRAWS

<table>
<thead>
<tr>
<th>Who Draws?</th>
<th>Patients(n)</th>
<th>CLABSI Incidents</th>
<th>CVC days</th>
<th>CLABSI Rate/1000 CVC Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>13</td>
<td>13</td>
<td>35,499</td>
<td>0.37/1000</td>
</tr>
<tr>
<td>Clinic/MD office</td>
<td>11</td>
<td>17</td>
<td>27,246</td>
<td>0.62/1000</td>
</tr>
<tr>
<td>Home Health RN</td>
<td>10</td>
<td>30</td>
<td>21,792</td>
<td>1.37/1000</td>
</tr>
<tr>
<td>Family Caregiver</td>
<td>6</td>
<td>32</td>
<td>12,448</td>
<td>2.57/1000</td>
</tr>
</tbody>
</table>
CONCLUSIONS

- CVC blood draws have a clinically significant increased CLABSI rate compared to PV blood draws

- Self blood draws have the lowest incidence of CLABSI (0.37/1000) in the CVC draw group
  - HPN patient is the guardian of their CVC and will be the most meticulous with their own care

- Clinic/MD office have the second lowest CLABSI rate (0.62/1000) in the CVC draw group
  - Infusion clinic nurses are familiar with CVC care
  - Consistent nurse
CONCLUSION

- Home Health nurses have the third highest CLABSI rate (1.37/1000)
  - Travel patient to patient in multiple of home environments
  - Variability of nurses staffed to one case

- Family caregivers have the highest CLABSI rate (2.57/1000) in the CVC draw sub-group. WHY ??
  - Too relaxed with home routine?
RECOMMENDATIONS

- HPN patients should closely scrutinize CVC care techniques with their CVC manipulations
  - Voice concerns when uncomfortable with caregiver technique
- Ongoing education and review of aseptic technique is vital for all HPN caregivers
- Blood drawing practices should be part of a total CLABSI incidence assessment for HPN patients.
- More investigation is needed to identify strategies to reduce CLABSI in the HPN population
STUDY LIMITATIONS

- CLABSI is a complex complication and other risk factors may have contributed to the CLABSI rate
- CVC draw subgroups were small

Thank you!