EvAluation of EduCational Interventions for Catheter Exit Site Management in Chronic Hemodialysis Patients at Saint Paul’s Hospital (ACCESS)

Cindy Ma, B.Sc. (Pharm); Fong Huynh, Pharm.D.; Marianna Leung, Pharm.D.; Mercedeh Kiall, M.D.; Marc Romney, M.D.; Victor Leung, M.D.; Beverly Jung, M.D.; Stan Marchuk, BSN, MN, NP(F); Rick Lascombe, RN, BSN, CNEph(C); Tinnie Chung, B.Sc. (Pharm); ACPR Beverly Jung, M.D.; Stan Marchuk, BSN, MN, NP(F); Rick Luscombe, RN, BSN, CNeph(C); Tinnie Chung, B.Sc. (Pharm); ACPR

Background
- Catheter-related bacteremia (CRB) is the most common and serious complication of hemodialysis (HD) patients who use catheters for vascular access.
- An exit site infection (ESI) may lead to CRB.
- Providence Health Care’s (PHC) Renal, Pharmacy and Microbiology departments collaborated to provide a series of educational interventions to HD staff to enhance their ability to accurately and promptly recognize and treat an ESI.
- The educational interventions included:
  1. ESI screening tool to objectively and systematically assess exit site at each HD run
  2. Proper exit site swabbing techniques
  3. Proper interpretation of exit site swab culture results

Methods
- Retrospective study of HD patients at Saint Paul’s Hospital
- Study period:
  1. 12 months pre-interventions (Jan 1, 2010 – Dec 31, 2010)
  2. 1 month educational intervention (Jan 1, 2011 - Jan 31, 2011)
  3. 12 months post-interventions (Feb 1, 2011 - Jan 31, 2012)

Primary Objectives
- To compare pre- and post-educational interventions:
  1. incidence of clinically diagnosed ESI (defined as an antibiotic course ≥ 10 days)
  2. use of topical and systemic antibiotics
  3. specimen quality as defined by Microbiology department

Secondary Objectives
- To compare pre- and post-educational interventions:
  1. incidence of presumed CRB
  2. number of hospitalizations related to CRB
  3. number of catheter replacements related to CRB

Results

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Pre n = 99</th>
<th>Post n = 102</th>
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<tbody>
<tr>
<td><strong>Age (years, mean ±SD)</strong></td>
<td>64.8 ± 14.2</td>
<td>64.9 ± 16.6</td>
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<td><strong>Male (%)</strong></td>
<td>57.8</td>
<td>63.6</td>
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<td><strong>Dialysis vintage (days, mean ± SD)</strong></td>
<td>482.5 ± 472.1</td>
<td>564.9 ± 564.9</td>
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<td><strong>Catheter vintage prior to enrollment (days, mean ± SD)</strong></td>
<td>124.2 ± 275.1</td>
<td>123.7 ± 265.1</td>
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<td>** Femoral Catheter (%)**</td>
<td>3.1</td>
<td>3.7</td>
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Table 1: Baseline Patient Characteristics

Limitations
- Retrospective study
- Small sample size
- Baseline co-morbidities not captured, e.g., injection drug use, diabetes
- Inaccurate data entry in PROMIS renal database
- Data not captured when patients admitted to other hospitals

Conclusions
- Systematic and objective assessment of the catheter exit site using ESI screening tool at each HD run:
  1. increased the number of swab specimens collected, antibiotic usage and antibiotic costs
  2. did not significantly affect the incidence of clinically diagnosed ESI, CRB and CRB-related hospitalizations and catheter replacements.
- A one-time educational session may be insufficient to produce sustained improvement in swabbing techniques and swab culture interpretations
- Need repeated educational sessions to reinforce learning and to capture all staff (including staff turnover)

Figure 1: HD Catheter Exit Site Assessment Form

Figure 2: Incidence of Clinically Diagnosed ESI

Figure 3: Specimen Quality

Figure 4: Use of Topical and Systemic Antibiotics

Figure 5: Incidence of Presumed CRB

Figure 6: Hospitalizations Related to CRB

Figure 7: Catheter Replacements Related to CRB