Patients with Acute Leukemia, Neutropenia and the Presence of a Central Line in Patients that Develop Bacteremia: A Retrospective Case-Control Chart Review

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Background/Setting

- Bacterial bloodstream infections are among the most frequent complications in leukemic patients due to prolonged neutropenia
- Grant 6 is a 51-bed acute care respiratory/oncology medical-surgical unit at Northern Light Eastern Maine Medical Center (NLEMMC) that has experienced several reported cases of central line-associated bacteremia since 2017
  - Most with acute leukemia who have undergone induction chemotherapy
- Over the past three years, Grant 6 has experienced a loss of nurses with greater than two years of experience in oncological care. Several nurses with certification in oncology (OCN) transferred to the outpatient setting.
- Oncological patients previously separated to one hallway are currently located in any bed available on Grant 6

Research Aims

- Aim #1: To examine for significant differences in demographic and patient profile between Case and Control groups
- Aim #2: To examine for significant differences in lab values between Case and Control groups
- Aim #3: To examine for significant differences in demographic and patient profile between Case and Control groups in patients with mucosal barrier (MB) bacteremia
- Aim #4: To examine the relationship between the changing dynamic of an acute care medical-surgical unit (e.g. geography, staff turnover, skill mix) and bacteremic rates in patients with central lines?

Methods

Retrospective Case/Control Design

- Chart review
- Oncological patients admitted from 1/2017-6/2020
- Cases-those that developed bacteremia during admission
- Controls-those that did not develop bacteremia during admission
- Excluded patients under the age of 18
- Non-OCNs in unit
- New graduate RNs in unit

Data Collection is Ongoing

Variables

<table>
<thead>
<tr>
<th>Variables</th>
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<tbody>
<tr>
<td>Age at diagnosis</td>
<td>Cognitive impairment</td>
<td>Organism listed as cause of bacteremia</td>
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<tr>
<td>Type of leukemia</td>
<td>Immunological disorders</td>
<td>Type of chemotherapy</td>
</tr>
<tr>
<td>Gender</td>
<td>Pressure injury</td>
<td>Number/site of cultures</td>
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<tr>
<td>Ever smoked</td>
<td>Presenting symptoms (e.g., flu-like, dental, fatigue, SOB)</td>
<td>Nutritional intake 72/48/24 pre nadir time</td>
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<tr>
<td>Living situation</td>
<td>Immunological disorders</td>
<td>Nutritional intake 72/48/24 post nadir time</td>
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<tr>
<td>Home medications</td>
<td>Type of CL catheter</td>
<td>Nutritional consult</td>
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<tr>
<td>Length of stay</td>
<td>Day/time when CL was placed</td>
<td>Oral symptoms around nadir time</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>Number of encounters</td>
<td>PI around nadir time</td>
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<tr>
<td>COPD</td>
<td>Lab values on admission</td>
<td>Patient received CLABSI education</td>
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<tr>
<td>Cardiovascular disease</td>
<td>Lab value at nadir time</td>
<td>Home service arrangements</td>
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<tr>
<td>Hypertension</td>
<td>Blood products</td>
<td>Line maintenance bundle compliance</td>
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<td>Arrhythmia</td>
<td>Encounter of bacteremia development</td>
<td>Insertion bundle compliance</td>
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<tr>
<td>Mobility limitations</td>
<td>Temperature at time of blood culture</td>
<td>Chlorohexidine bath compliance</td>
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References


doi:10.3390/antibiotics8030106

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