Title: An Exploration of Bloodstream Infection Risk Factors on Hospitalized Hematological Malignancy Patient

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References:

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Abstract Summary:
To explore the risk factors of central vein catheter-related bloodstream infection (CVCRBI) in hospitalized hematological cancer patients. We retrospectively reviewed the charts and electro diagnostic (EDX) studies of 163 patients who were referred to the electromyography laboratory from inpatients in hematology ward.

Learning Activity:

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<th>LEARNING OBJECTIVES</th>
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<tr>
<td>The objective was to explore in hospitalized hematological malignancy patient attributes.</td>
<td>Retrospective and prospective studies were employed</td>
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<tr>
<td>The objective was to explore the bloodstream infection risk factors in hospitalized hematological malignancy patients with central venous catheter.</td>
<td>Electronic medical records (EMR) from a medical center in southern Taiwan were used as the database. Self-prepared forms were used as research tools for risk factor data collection from patients in the Department of Hematology and Oncology. Medical and nursing records were used as the source of information.</td>
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Abstract Text:
**Background:**

Central venous catheter is an important method for cancer patients in the Department of Hematology and Oncology to receive chemotherapy treatment.

**Objective:**

To explore the risk factors of central vein catheter-related bloodstream infection (CVCRBI) in hospitalized hematological cancer patients.

**Design:**

Retrospective and prospective studies were employed.

**Methods:**

We retrospectively reviewed the charts and electro diagnostic(EDX) studies of 163 patients who were referred to the electromyography (EMG) laboratory from inpatients in hematology ward between 2010 and 2015. Risk factors were categorized into three parts: 1. patient-related factors, including classification of cancers, performance status, comorbidities, absolute neutrophil count (ANC) status and nutrition status; 2. medical treatment-related factors, including history of protective positive pressure isolation rooms, chemotherapy, duration of central vein catheter (CVC) placement, the use of antimicrobials, steroids, granulocyte-colony stimulating factor, as well as blood transfusions and invasive procedures; and 3. nursing care-related factors, including the numbers of infusion lines, contact dermatitis and routine dressing care of CVC. Central vein catheter-related bloodstream infection (CVCRBI) patients were coded in infection group, and others were coded as control group. The risk factors were presented with descriptive statistics, and the bloodstream infection risk factors were then established using Student's t-test, analysis of variance (ANOVA) and logistic regression analysis.

**Results:**

A total of 163 patients’ date were collected and 19% of them were CVCRBI (N=31). Patients had CVCRBI had longer admission days than those without infection (32.4 versus 22.7 days, P=0.003). There were higher CVCRBI rate in patients with ANC less than 500/mm³ than those patients with ANC more than 500/mm³ (77.4% versus 49.2%, P=0.005). In addition, the infection group got more neutropenia persisting for more than one week compared to the control group (45.2% versus 22.7%, P=0.007). There was also higher incidence of no routine dressing care of CVC in the infection control than the control group (51.6% versus 28.0%, P=0.012). Patients with contact dermatitis had a marginal trend toward increasing CVCRBI than those not (16.1% versus 5.3%, P=0.053). The odds ratio of bloodstream infection rate during the period between 1 and 7 days of the absolute neutrophil count (ANC) was 3.088 times higher than that of non ANC, the bloodstream infection rate during the period more than 8 days of ANC was 4.978 times higher than that of non ANC. The odds ratio of bloodstream infection rate of neutropenia not exceeding 500/mm³ was 3.534 times higher than that of neutropenia exceeding 500/mm³, and the odds ratio of bloodstream infection rate of non-routine dressing is 2.739 times higher than that of routine dressing.

**Conclusions:**

Longer admission days, ANC less than 500/mm³, neutropenia persisting for more than one week, and no routine dressing care of CVC would increase CVCRBI.