Impact of Social Determinants of Health on Unplanned Acute Care Utilization for Patients with Hematologic Malignancies

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INTRODUCTION

Background

Improving the ability to predict which patients are at increased risk for acute care services subsequent to hospitalization can help to more effectively intervene and improve quality care.

This study evaluated the performance of risk models to predict unplanned 30-day acute care service utilization among adult inpatients with newly diagnosed hematologic malignancies. The study explored the impact of social determinants of health on unplanned acute care service utilization (aligned with specifications for proposed measure OP-35 from the CMS Hospital Outpatient Quality Reporting Program) and focused on social determinants of health.

Methods

The study included 933 unique adult patients admitted to four acute care inpatient facilities within a non-profit community based healthcare system in Southern California during calendar years 2012 to 2017.

Risk models integrated a comprehensive set of structured data elements (demographics, medical conditions, treatments, services) using clinical information from electronic medical records and facility oncology registries.

Predictive models were constructed using a multivariable logistic regression, with calculation of standardized coefficients to rank predictor variables with the greatest impact on unplanned 30-day acute care service utilization. Exploratory data mining techniques were used to augment classification of at-risk patients as follows:

- A decision (classification) tree data mining approach was conducted to explore non-traditional cut-points.
- Data-derived groupings were achieved by probability-based classifications as alternatives to traditional cut-points.
- Neatly classified variables were included in follow-up regression models and c-statistics were investigated.

RESULTS

Unplanned Acute Care Service Rates Within 30 Days By Type of Hematologic Malignancy

<table>
<thead>
<tr>
<th>Type of Hematologic Malignancy</th>
<th>Unplanned Acute Care Service Rates Within 30 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphoma</td>
<td>33%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>21%</td>
</tr>
<tr>
<td>Myeloma</td>
<td>15%</td>
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</tbody>
</table>

Cancer Type & Unplanned Acute Care Service Rates

- Lymphoma was the most prevalent hematologic malignancy (48.7%), followed by leukemia (25.2%), myeloma (14.4%), and mixed type (2.1%).

- Approximately one-fifth (21.2%) of patients received unplanned acute care within 30 days after the index hospitalization.

- There were no statistically significant differences in unplanned acute care service utilization by primary type of cancer (p = 0.413).

Social Determinants of Health

- Nearly one-third of all patients reported not having a support person or care partner.

- There were statistically significant differences between cohorts based on past history of counseling/behavioral health medications, history of substance use, and lack of social health consult during the hospital stay.

PATIENT CHARACTERISTICS

- The mean age of all participants was 65 years and 55.1% were male.

- Individuals with self-reported Hispanic/Latino origin accounted for 69% of the "other" race/ethnicity category.

- The most prevalent insurance category was Medicare/supplemental plans.

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Predictive Models: Leukemia

- Results were identical for both the standard predictive model and the final model produced using the exploratory data mining approach.

- Lack of social work consultation and past history of counseling or behavioral health medications substantially increased the risk for acute care service utilization among patients diagnosed with leukemia.

- Significant risk predictors for unplanned acute care service utilization subsequent to initial hospitalization for patients with newly diagnosed hematologic malignancies.

Predictive Models: Lymphoma

- Results were identified for both the standard predictive model and the final model produced using the exploratory data mining approach.

- Other risk factors included receipt of hormone therapy (in conjunction with chemotherapy) and study facility.

IMPLICATIONS FOR PRACTICE

This non-interventional, retrospective observational study demonstrated high rates of unplanned acute care utilization subsequent to hospitalization for patients with newly diagnosed hematologic malignancies.

Results demonstrated differences in risk factors among patients associated with the type of hematologic malignancy. Unplanned acute care utilization was substantially impacted by social determinants of health for patients with a new diagnosis of lymphoma or myeloma. In contrast, other factors contributed to increased risk for patients with leukemia, including shorter lengths of stay during the index hospitalization and race/ethnicity.

Study limitations include the retrospective observational design, using data available from electronic medical records and facility oncology registries. Although this five-year study time period increased the overall number of patients, it was beyond the scope to investigate the impact of race/ethnicity and length of stay on unplanned acute care service utilization.

Consistent with recent research1,2 conducted by the authors, the study provides insights into patients’ experiences and how factors that influence healthcare utilization are influenced by social determinants of health on unplanned acute care service utilization.

REFERENCES