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Risk Factor Analysis for 30-Day Readmission Rates of Newly Tracheostomized Children

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Objective: Pediatric patients undergo tracheostomy for a variety of reasons; however, medical complexity is common among these patients. Although tracheostomy may help to facilitate discharge, these patients may be at increased risk for hospital readmission. The purpose of this study was to evaluate our institutional rate of 30-day readmission for patients discharged with new tracheostomy and to identify risk factors associated with readmission.

Study Design: A retrospective cohort study was conducted for all pediatric patients ages 0-18 years with new tracheostomies at our institution over a 36-month period.

Methods: A chart review was performed for all newly tracheostomized children from 2013 to 2016. We identified documented readmissions within 30 days of discharge, reasons for readmission, demographic and socioeconomic variables including age and ethnicity, initial discharge disposition, co-morbidities, and socioeconomic status estimated by mean household income by parental zip code. The charts were then reviewed to determine the primary reason for readmission.

Results: 45 patients were discharged during the study time period. A total of 13 (28.9%) readmission within 30 days of discharge. Among these 13 patients, the majority (61.5%) were readmitted for lower airway concerns, many (30.8%) were admitted for respiratory concerns, and only one patient (7.7%) was readmitted for a reason related to tracheostomy (tracheomalacia breakdown). Age, ethnicity, discharge disposition, co-morbidities, and socioeconomic status were not associated with differences in readmission rates. Patients readmitted within 30 days had a higher number of admissions within the first year.

Conclusion: Pediatric patients with new tracheostomies are at high risk for readmission after discharge from initial hospitalization. The readmissions are most likely to be secondary to underlying medical complexity rather than issues related specifically to the tracheostomy procedure.

Methods

Retrospective chart review from June 2013 through June 2016 of all tracheostomy performed at the institution.

Excluded if they were decannulated or died prior to discharge, or if they were transferred to another institution.

Age of tracheostomy

BMI

Co-morbidities

Demographics

• Ethnicity
• Sex
• Home zip code (used to estimate an obtain an estimate of family income)

Results

Where they readmitted within 30 days of discharge

Primary reason for readmission

Number of readmission in the following year

Data analysis performed to compare the group that required readmission with those that did not require readmission.

Statistics calculated with Microsoft Excel

Two-sided Student’s t-tests were used for continuous variables

Pearson’s uncorrected r2 tests were used for categorical variables

Table 1. Comparison of demographic and clinical characteristics

<table>
<thead>
<tr>
<th>Category</th>
<th>Readmitted</th>
<th>Not Readmitted</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>22.6</td>
<td>44.6</td>
<td>0.31</td>
</tr>
<tr>
<td>Female</td>
<td>6/19 (31.6%)</td>
<td>13/19 (68.4%)</td>
<td>0.73</td>
</tr>
<tr>
<td>Male</td>
<td>7/26 (26.9%)</td>
<td>16/26 (61.5%)</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td>3/11 (27.3%)</td>
<td>8/11 (72.7%)</td>
<td>0.72</td>
</tr>
<tr>
<td>Caucasian</td>
<td>9/24 (37.5%)</td>
<td>15/24 (62.5%)</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>1/10 (10.0%)</td>
<td>9/10 (90.0%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>0/10 (0.0%)</td>
<td>0/10 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Mean household income (by zip code)</td>
<td>$60,802</td>
<td>$56,634</td>
<td>0.59</td>
</tr>
</tbody>
</table>

Table 2. Comparison of co-morbidities between readmitted and non-readmitted patients

<table>
<thead>
<tr>
<th>Co-morbidity</th>
<th>Readmitted N=13</th>
<th>Not Readmitted N=32</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurologic</td>
<td>5/13 (38.5%)</td>
<td>3/32 (9.4%)</td>
<td>0.06</td>
</tr>
<tr>
<td>Chronic lung disease</td>
<td>6/13 (46.2%)</td>
<td>8/32 (25.0%)</td>
<td>0.04</td>
</tr>
<tr>
<td>Cardiac</td>
<td>4/13 (30.8%)</td>
<td>14/32 (43.8%)</td>
<td>0.42</td>
</tr>
<tr>
<td>Upper airway</td>
<td>4/13 (30.8%)</td>
<td>14/32 (43.8%)</td>
<td>0.42</td>
</tr>
<tr>
<td>Syndromic</td>
<td>4/13 (30.8%)</td>
<td>9/32 (28.1%)</td>
<td>0.65</td>
</tr>
<tr>
<td>Sustentacular</td>
<td>1/13 (7.7%)</td>
<td>2/13 (15.4%)</td>
<td>0.36</td>
</tr>
<tr>
<td>Renal</td>
<td>1/13 (7.7%)</td>
<td>3/13 (23.1%)</td>
<td>0.41</td>
</tr>
<tr>
<td>Other</td>
<td>1/13 (7.7%)</td>
<td>7/32 (22.2%)</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Figure 1: Percentage of patients requiring readmission within the first 30 days after discharge after tracheostomy by indication

Figure 2: Percentage of patients discharged to home and to chronic care facilities, and which portion of these patients required readmission within 30 days.

Figure 3: Table 1. Comparison of demographic and clinical characteristics.

Figure 4: Table 2. Comparison of co-morbidities between readmitted and non-readmitted patients.

RISK FACTOR ANALYSIS FOR 30-DAY READMISSIONS OF NEWLY TRACHEOSTOMIZED CHILDREN

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Methods

We performed an additional review of medical records for patients who were readmitted within 30 days of discharge.

Analysis

We performed further quality improvement investigation to see why we may be able to prevent future readmissions as well.

Conclusions

Pediatric patients with new tracheostomies are at high risk for readmission after discharge from initial hospitalization. However, these readmissions are rarely related to issues related directly to the tracheostomy itself and more likely related to underlying medical conditions and demographics. Given our study identified trends and was unable to identify statistically significant risk factors, further research is needed to establish a basis for this complex population after this procedure allowing for comparison with other institutions. As these patients have high levels of complexity and risk, their readmission rates are not comparable to children undergoing other surgical procedures.

References