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

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ABSTRACT

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 tracheostomies 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 investigated documented readmissions within 30 days of discharge, reasons for readmission, demographic variables including age and ethnicity, initial discharge disposition, co-morbidities, and socioeconomic status estimated by mean household income by parental zip code. Results: 45 patients were discharged during the study time period. A total of 13 (28.9%) required 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 reasons unrelated to tracheostomy or respiratory concerns, and only one patient (7.7%) was readmitted for a reason related to tracheostomy (tracheostomy 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 secondary to underlying medical complexity rather than issues related specifically to the tracheostomy procedure.

BACKGROUND

Previous studies have shown that children with tracheostomy dependence have high utilization of hospital resources, including overall number of unplanned admissions and amount of hospital stay per admission. Pediatric patients who require tracheostomy placement have high rates of readmission within the first 6-12 months after tracheostomy (tracheostomy 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.

METHODS

IRB approval obtained from Nemours/Wilmingon, DE IRB.

- Retrospective chart review from June 2013 through June 2016 of all tracheostomies performed at Nemours.
- Excluded if they were decannulated or died prior to discharge, or if they were transferred to another institution.

- Age at time of tracheostomy
- BMI percentiles
- Co-morbidities
- Demographics
  - Ethnicity
  - Sex
  - Discharge destination (home versus chronic care facility)
  - Home zip code (used to estimate an average of the household income of the patient's family)
  - 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.
- Statistics calculated with Microsoft® Excel

- Two-tailed Student’s t-test were used for continuous variables
- Pearson's uncorrected r² tests were used for categorical variables

RESULTS

- 45 patients included in the study
- 28.9% (13/45) required readmission within 30 days of discharge

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

DISCUSSION

- Our readmission rate of 28.9% was consistent with Gaudreau et al., who found a 27% readmission rate in their patients.
- Readmissions were rarely due to complications directly related to the tracheostomy itself and were more commonly associated with lower airway concerns and conditions associated with the medical complexity of the child. Often, these unplanned admissions were secondary to unavoidable causes such as new viral infections or issues unrelated to tracheostomy or respiratory concerns, such as a feeding tube.
- Age of tracheostomy placement, ethnicity, and sex were not associated with differences in rates of readmission in this population. While the age at tracheostomy placement was different between the two groups, this difference was not significant.
- Socioeconomic status measured by estimated household income was not associated with differences in rates related to underlying medical conditions. Our findings do not support adult studies that have found socioeconomic status to be a factor in readmissions.
- Children who require tracheostomy placement have high rates of medical complexity related to underlying medical conditions. Although, it did not show a statistical significance in the current cohort, a numerical proportion of children with neurologic dysfunction had higher rates of readmission, which is similar to the finding by Berry et al., who found that children with neurologic impairment have higher rates of hospital resource utilization than those without.

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

Table 1. Comparison of demographic and clinical characteristics

- Mean age (months): 22.6 vs 44.6 (p = 0.11)
- Sex: Female vs Male (6/19 (31.6%) vs 13/26 (50%); 0.73)
- Ethnicity: Caucasian vs African American vs Hispanic (9/24 (37.5%) vs 10/13 (76.9%) vs 11/11 (100.0%); 0.27)
- Mean household income (by zip code): $56,802 vs $65,634 (p = 0.50)

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

- Neurologic vs Cardiac vs Pulmonary vs Other (p = 0.002)

QUALITY IMPROVEMENT

Reducing hospital readmissions is a nationwide goal. It has the potential to decrease costs as well as improve quality and patient experience. The group requiring readmission in the first 30 days had significantly more admissions in the year to come. Thus, if we can identify factors that contribute to hospital readmissions, 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. These readmissions are rarely related to tracheostomies themselves and more likely related to underlying medical conditions. Although our study identified trends and was unable to identify statistically risk factors for readmission, our results suggest that outpatient care may have more of an impact on the rate of readmission over inpatient care, such as respiratory complications and dysphagia. Given the current attention and interest on 30-day hospital readmissions rates, a number of factors, which is not as important as it is established as a baseline 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 healthy children undergoing other surgical procedures.

REFERENCES