Pediatric Epiglottitis: Predictors of Conservative Treatment

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Introduction

Epiglottitis is a potentially lethal infection in children. Due to the increasing rarity of this disease, suspicion for the diagnosis must remain high in order for prompt recognition and treatment. Though epiglottitis has decreased in incidence after the introduction of the *Haemophilus Influenzae* type b vaccine , it remains as a prevalent entity with a shifting prevalence of causation.

Reviewing the literature in a chronological order reveals paradigm shifts in management. Historically, treatment protocols for epiglottitis involved elective securement of the airway. Rates of intubation and tracheotomy for this disease continue to decline.

We sought to examine a larger sample size by evaluating trends via a national database. By looking at data in aggregate, we can accumulate large sample sizes to provide statistically significant, meaningful results. Analysis of a large national database capturing both pediatric and adult epiglottitis hospital admissions from 1998-2006 show that epiglottitis continues to persist as an important disease, and that there are definite trends towards conservative management. These findings led to our clinical question: what are the specific variables that predict which pediatric patients will require their airway to be secured?

Methods

The Kids Inpatient Database (KID) from the Agency for Healthcare Research and Quality is a data set from the Healthcare Cost and Utilization Project, designed to analyze pediatric-specific discharge data. The discharge data is compiled from 44 states and represents over 2 million pediatric inpatient discharges. (http://www.hcup us.ahrq.gov/kidoverview.jsp)

The KID (2006 and 2009) was searched using ICD-9 CM codes for acute epiglottitis with (464.30) and without (464.31) obstruction. Demographics and hospital characteristics of pediatric patients who required airway intervention (defined as intubation or tracheotomy) were compared to those who were managed conservatively without airway intervention.

Results

Table 1: Demographics

Variable	Intervention N=115	Percentage	No intervention N=705	Percentage	p-value
GENDER, female, n (%)	41	35.65%	239.6	33.99%	0.876
RACE					0.8354
White	50	43.48%	295.9	41.97%	-
Hispanic	22.2	19.30%	110.5	15.67%	0.5537
Other	20.9	18.17%	130.7	18.54%	0.6817
AGE, mean (SD)	6.12 (0.80)		7.73 (0.36)		0.0781

Table 2: Procedural Interventions

Procedure	Intervention N=115	Percentage	No intervention N=705	Percentage	p-value
Bronchoscopy	28.8	25.04%	41	5.82%	<0.0001
BIPAP or CPAP	97.1	84.43%	43.7	6.20%	<0.0001
Continuous invasive mechanical ventilation for less than 96 consecutive hours	64.6	56.17%	26	3.69%	<0.0001
Laryngoscopy or Tracheoscopy	65.9	57.30%	107.3	15.22%	<0.0001

Table 3: Hospital Discharge Data

Variable	Intervention N=115	Percentage	No intervention N=705	Percentage	p-value
ADMISSION TYPE					0.0149
Emergency	72.2	62.78%	353	50.07%	
Urgent	15.1	13.13%	176.7	25.06%	
HOSP LOCATION/TEACHING					0.0022
Urban non-teaching	19.5	16.96%	198.8	28.20%	
Urban teaching	76.8	66.78%	303.7	43.08%	
HOSPITAL BED SIZE					0.0318
Small/medium	35.7	31.04%	320.9	45.52%	
Large	68.2	59.30%	354.8	50.33%	
HOSPITAL TYPE					<0.0001
Not children's	39.3	34.17%	471.7	66.91%	
Children's general hospital	20.5	17.83%	66	9.36%	
Children's unit	37	32.17%	86.1	12.21%	
DISCHARGE INFORMATION					
Length of stay, mean (SD)	10.87 (2.81)		3.65 (0.50)		0.0127
Total charges, mean (SD)	$83037 (15480)		$18487 (2468.36)		<0.0001

Results

820 patients were included in the analysis. 115 (14%) required intervention and 86% were managed conservatively. Mortality was less than 10 patients. There were no significant differences between groups with respect to age, gender or race. Characteristics predictive of conservative management include urgent admission type (vs. emergent, p=0.015), urban non-teaching hospital (vs. urban teaching, p=0.002), non-children's hospital (vs. children's unit or children's hospital, p<0.0001) and small/medium sized hospital (vs. large, p=0.03). Length of hospital stay was shorter (mean 3.65 days vs. 10.87 days, p=0.01) and cost was lower in patients who were managed conservatively (mean $18,487 vs. $83,037, p<0.0001).

Conclusions

- The majority of pediatric epiglottitis patients are currently managed without intubation or tracheotomy with low mortality.
- Conservatively managed admissions are more likely for non-emergent presentations at non-pediatric, non-teaching, small/medium sized hospitals, and are lower cost.
- Additional studies are needed to further characterize patients which would be appropriate for conservative management.

References

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