Croup is one of the most common causes of stridor in children during the fall and winter seasons. The causative organisms are typically viral, such as parainfluenza and influenza. While most children can be managed on an outpatient basis, a small proportion has significant airway symptoms, which require admission to the hospital or airway intervention. Treatment typically consists of steroids, nebulized racemic epinephrine, and heliox. If the patient’s symptoms do not improve over 48 hours, the possibility of bacterial tracheitis must be entertained.

Although croup is typically a self-limited disease, it can be complicated by upper airway obstruction and respiratory distress. The role of diagnostic laryngoscopy and bronchoscopy (DL&B) in the management of acute hospitalized croup remains unclear. Few studies have correlated risk factors noted at the time of consultation with DL&B findings and applicability of these studies has been limited.

One of the risks of DL & B is the potential of worsening the respiratory status. Not only is there the exposure to general anesthesia, but also instrumentation of an already swollen subglottis can cause further edema. Patients can then require intubation or transfer to a higher level of care post-operatively resulting in a prolonged hospital course. The benefits of diagnosing bacterial tracheitis (and thus changing medical management) are generally thought to outweigh the risks of worsening the respiratory status if the patient has viral croup.

The purpose of this study was to review our experience at Texas Children’s Hospital with direct laryngoscopy and bronchoscopy in hospitalized patients with viral croup. We investigated (1) the frequency of viral vs. bacterial hospitalized croup at TCH (2) the epidemiological characteristics of hospitalized croup and (3) the efficacy of applying operative direct laryngoscopy and bronchoscopy in the detection of other significant respiratory pathology in certain groups of hospitalized patients.

The role of direct laryngoscopy & bronchoscopy in hospitalized croup

Sannya Hede1, B.A., Julina Ongkasuwan1,2, M.D.

1Department of Otolaryngology Head & Neck Surgery, Baylor College of Medicine
2Adult & Pediatric Laryngology, Texas Children’s Hospital, Houston, TX

INTRODUCTION

The purpose of this study was to review our experience at Texas Children’s Hospital with direct laryngoscopy and bronchoscopy in hospitalized patients with viral croup. We investigated (1) the frequency of viral vs. bacterial hospitalized croup at TCH (2) the epidemiological characteristics of hospitalized croup and (3) the efficacy of applying operative direct laryngoscopy and bronchoscopy in the detection of other significant respiratory pathology in certain groups of hospitalized patients.

MATERIALS & METHODS

A retrospective chart analysis of 340 cases (338 patients) of admitted with a diagnosis of croup at Texas Children’s Hospital over a nine-year period between September 2003 and December 2011 was carried out. Patients with tracheomalacia, epiglottitis and non-respiratory complications (URTI etc.) were excluded from the study. Patient information was recorded and tabulated into a data key that numerated diagnostic and therapeutic criteria. Pre and post procedure physiologic parameters were recorded. Normal oxygen saturation (SO2) was > 96% on room air. Fever was defined as > 100.4oF, and respiratory (RR) and heart Rate (HR) were based on normative values for age.

RESULTS

Table 1: Epidemiological Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total</th>
<th>Viral Croup</th>
<th>Bacterial Croup</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in months</td>
<td>16.4±5.9</td>
<td>17.4±5.8</td>
<td>15.2±5.1</td>
<td>0.001</td>
</tr>
<tr>
<td>Days of Symptoms Before Admission</td>
<td>2.3±1.5 (15-54 days)</td>
<td>4.6±5 days (14-34 days)</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Hospital Course Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total</th>
<th>Viral Croup</th>
<th>Bacterial Croup</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Intubations</td>
<td>145 (42.9%)</td>
<td>10 (90.9%)</td>
<td>0 (0%)</td>
<td>0.02</td>
</tr>
<tr>
<td>Age at Lower airway evaluation</td>
<td>24.6±5.2</td>
<td>24.4±5.0</td>
<td>24.7±5.4</td>
<td>0.85</td>
</tr>
<tr>
<td>Risk of airway obstruction on intubation</td>
<td>214 (63.9%)</td>
<td>48 (64.7%)</td>
<td>166 (70.9%)</td>
<td>0.24</td>
</tr>
</tbody>
</table>

CONCLUSIONS

Mild airway anomalies are common in children who are hospitalized for croup and are undergoing DL&B. Nevertheless, significant findings on DL & B do occur and when detected, often represent life-threatening complications. Of the 250 patients who underwent DL & B, 8 patients had bacterial findings and 5 patients had other significant airway findings. Seventeen patients in total were diagnosed with bacterial croup. Tracheomalacia; age and onset of symptoms on admission were found to be a statistically significant sign in distinguishing bacterial croup from viral croup. Thus, together with a thorough clinical history, DL & B can be used effectively to detect and manage severe manifestations and complications of these patients.

REFERENCES