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Presented at the Philippine Society of Otolaryngology Head and Neck Surgery Descriptive Research Contest, September 19, 2013. Natrapharm, The Patriot Building, Parañaque City.



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Adult Acute Epiglottitis: An Eight - Year Experience in a Philippine Tertiary Government Hospital

ABSTRACT

Objective: To review cases of adult acute epiglottitis in a tertiary government hospital and describe the clinical presentations, diagnostics performed, management and outcomes.

Methods:

Design: Retrospective Chart Review

Setting: Tertiary Government Hospital

Participants: Records of patients admitted by or referred to the Department of Otolaryngology Head and Neck Surgery with a diagnosis of acute epiglottitis from January 2008 to August 2014 were identified from the department census and charts were retrieved from the Hospital Record Section and evaluated according to inclusion and exclusion criteria. Information regarding demographic data, clinical features, laboratory and other diagnostic examinations, medical management, and length of hospital stay were collected.

Results: There were 20 cases in 7 years and 8 months. Most were male, 18 to 37-years-old, presenting with dysphagia, odynophagia and a swollen epiglottis on laryngoscopy. Abnormal soft-tissue lateral radiographs of the neck and leukocytosis were seen in 73 % and 83%, respectively. Intravenous antibiotics and corticosteroids were administered in all cases, and mean hospital stay was 11.2 days.

Conclusion: Adult acute epiglottitis should be highly suspected in patients presenting with dysphagia, odynophagia, and muffling of the voice even with a normal oropharyngeal examination. History of respiratory infection, co-morbidities, smoking and alcohol intake, concomitant laryngeal pathology and supraglottic structure insults contribute to development of the disease. Laryngoscopy is still the gold standard in diagnosis. Airway protection is mandatory but prophylactic intubation or tracheostomy are not advised. Intravenous antibiotics are necessary and corticosteroids may be of benefit.

Keywords: epiglottitis, supraglottitis, epiglottis, adult, Philippines



Acute epiglottitis is a serious life threatening disease due to its potential for sudden airway obstruction in a previously healthy individual.^{1,2} Structures involved include the supraglottic region of the oropharynx, epiglottis, vallecula, arytenoids and aryepiglottic folds.³ Due to the loose and vascular mucosa surrounding the epiglottic area, it is vulnerable to insults caused by inflammation, irritation or allergic reaction. For this reason, the term supraglottitis is more appropriate.⁴

A search of local (HERDIN) and international databases (Embase, PubMed - MEDLINE, Google Scholar, and ScienceDirect) using the following keywords: epiglottitis, supraglottitis, adult, Philippines revealed that this is the second case series on acute epiglottitis in the Philippines with the first study done in 1947.⁵ The limited documentation of adult acute epiglottitis in the country and importance of awareness of its urgency prompted this study.

Our objective was to review the cases of adult acute epiglottitis at a tertiary referral government hospital in the Philippines over a span of 7 years and 8 months; and to describe its clinical features, risk factors, diagnostic examinations performed, treatment, and outcomes as measured by improvement of symptoms and length of hospital stay.

METHODS

This study considered all adult patients diagnosed with supraglottitis - hyperemia and edema of the epiglottis via laryngoscopy, who were admitted by or referred to the Department of Otolaryngology Head and Neck Surgery in a 600-bed tertiary government referral hospital from 2008 to 2014 for inclusion. Those who had supraglottitis due to caustic ingestion were excluded.

Potential cases were identified from the department census and charts were retrieved from the Hospital Record Section and reviewed according to inclusion and exclusion criteria. A total of 20 cases were identified but only 18 charts were available for review. Information regarding demographic data, clinical features, laboratory and other diagnostic examinations, medical management, and length of hospital stay were collected. All data recovered from chart and medical records were included in the analysis. Summary statistics such as mean, median (range) and frequency (proportions) were used to describe continuous ordinal and nominal variables. Data encoding, processing and analysis were performed via Microsoft Excel for Mac 2011 v 14.0.0.

This study was exempted from full review by our hospital IRB and conducted in accordance with the Declaration of Helsinki and the National Guidelines for Biomedical Research of the National Ethics Committee (NEC) of the Philippines. Data collected from the chart review were treated with confidentiality, assigning unique alphanumeric codes in consecutive order to protect the identity of patients. Records were not uploaded on any open databases for public viewing. Attending physicians assigned to the cases were not recorded either.

RESULTS

Of the 20 consecutive cases of acute epiglottitis identified, 18 charts were available for review. There were 16 males and 4 females, with age range of 18 – 68 years old and a median of 33.5 years. One patient who had a recurrence of epiglottitis within the same year was counted twice.

The most common presenting symptoms were dysphagia (100%), odynophagia (89%) and voice changes (83%) characterized as hoarseness or muffling. (Table 1) One patient who was later intubated additionally presented with irritability, stridor and cyanosis.

Table 1. Presenting symptoms of adult patients with acute supraglottitis (n=18)

Symptom	Frequency (n)	Total (n)	Percent (%)
Dysphagia	18	18	100
Odynophagia	16	18	89
Throat Pain*	6	7	86
Voice Changes	15	18	83
Dyspnea	10	18	56
Drooling	5	18	28
Irritability	2	18	11
Stridor	2	18	11

* 11 charts did not indicate presence or absence of the symptom

Hyperemia of the posterior pharyngeal wall and drooling of saliva were observed in half of the cases. Concomitant laryngeal pathologies were observed in 39% and included cysts, pustules, ulcers and masses. Granulation tissue on the epiglottis was present in the intubated patient and a supraglottic mass was seen in another patient who had a tracheostomy.

Of all the patients, 56% had previous consults with other physicians and were managed as cases of respiratory tract infection. Other co-morbidities included hypertension (22%) and diabetes mellitus (22%). Half were smokers and 13 were alcoholic beverage drinkers. Interestingly, all 8 patients who had a history of fluid intake of extreme temperatures (thermal insult) prior to the onset of symptoms recalled having taken either a cold or hot beverage.

On admission, 78% had leukocytosis with a mean count of $19.9 \times 10^9/l$, with predominance of neutrophils. Chest radiography showed active parenchymal infiltrates in 47% of the cases and soft-tissue lateral radiographs of the neck were abnormal in 73% with the following findings: enlarged epiglottis, narrowed airway, and straightening of the vertebra.

Management included intravenous antibiotics (cefuroxime or ceftriaxone) and intravenous hydrocortisone. Ten patients presented



with dyspnea and half were given oxygen supplementation via nasal cannula. One patient developed severe dyspnea, irritability, cyanosis and stridor and was subsequently intubated. Another patient had a supraglottic mass and eventually needed a tracheostomy.

The time interval from the onset of symptoms to emergency room consult varied from less than 6 hours to as long as two months. The patient with rapid progression of symptoms developed dyspnea in less than 6 hours and was later intubated.

Hospital stay was a median of 8 days (range: 2 - 37 days) for all patients. One patient stayed for 34 days in the hospital due to relapse of epiglottitis within the same admission. Another was admitted for 37 days because of a supraglottic neoplasm, although epiglottic swelling had decreased significantly in this patient by the 16th hospital day. This was the longest time to resolution recorded for significant decrease in epiglottic swelling on laryngoscopy which was noted as early as the second hospital day.

DISCUSSION

Supraglottitis is an uncommon disease entity that may occur at any age.⁶ Although classically described as a disease of childhood, it is said to have nearly disappeared in children and is now almost exclusively found in adults.⁷

Supraglottitis is traditionally related to *Haemophilus influenzae* infection although its isolation is more common in children (68-72%) than adults (21-23%).⁸ Other pathogens have been implicated in adult supraglottitis and may also be caused by thermal injuries suffered from smoking and illicit drug use.^{1,4}

Patients in this study were predominantly male (80%). This was comparable to other series where authors described a 55-81% preponderance of male subjects.^{7,9-11} The ages of the patients in this study ranged from 18-68 years and majority (55%) belonged to the 18 to 39-year-old age group. This was consistent with studies whose subjects were mostly adults in the second to fourth decade of life.^{1,7,10,12}

The rate of 2.86 cases per year in our study is quite low compared to other single-institution studies reviewed, documenting 3.7-7.1 cases per year.^{2,9-10,13-14} Interestingly, there was an increase in the number of patients diagnosed with epiglottitis in our institution in 2014 when 7 patients were documented. Some authors suggest that increased awareness of physicians regarding the disease and the greater availability of non-invasive ways of visualizing the laryngeal structures may have contributed to the increased diagnosis rate.¹

Similar to previous studies,^{2,6-7,12} patients commonly presented in the emergency room with dysphagia, odynophagia, and voice changes.

Throat pain was also present in 6 out of 7 patients who were asked about this symptom.

Nine of the patients initially seen by other physicians were diagnosed as simple cases of URTI. This may be attributed to laryngoscopy not being a part of routine examination in the general setting. In addition, patients with supraglottitis may also present with a normal-appearing oropharynx, which may mistakenly preclude the need for further examination. The abovementioned factors may have possibly resulted in misdiagnosis of cases; other studies cite 67% to 71% of cases were commonly assessed to be URTI, pneumonia, and angina with pharyngitis. Some patients may even require intubation on follow up.^{2,9}

Adult supraglottitis has a more variable presentation depending on etiology, and the rates at which symptoms appear help prognosticate its outcome. If patients complain primarily of sore throat and dysphagia with a more gradual onset, which was as long as a two months in this study, it may be more likely have a milder course.¹ In contrast, patients who present with dyspnea, stridor, drooling and isolation of *H. influenzae* are more likely to have airway complaints and a more aggressive course of disease.¹ The patient who presented with a sudden onset of dyspnea, dysphagia, odynophagia, drooling, and stridor 6 hours prior to consult was immediately intubated in the emergency room.

A thorough history and physical examination is vital to diagnosis. Comorbidities such as hypertension, diabetes, alcoholism, smoking history and a recent upper respiratory infection that may be elicited in the history may play a role in the course of the disease, as was also found in patients in this study.^{1,6,10,14} Other findings may include epiglottic abscesses, history of nasopharyngeal carcinoma, tonsillitis, and vallecular cysts.^{1,2,4,6,10,14} In this study, 39% of patients showed any of the following supraglottic findings on laryngoscopy: pustules, cyst and granulation tissue on the epiglottis and hypopharyngeal mass.

Abnormal chest radiographs in 8 out of 17 patients had active parenchymal infiltrates which may be attributed to pneumonia, empyema or pulmonary edema.^{1,4,9}

Soft tissue lateral radiographs of the neck were positive in 73% of the cases. This was consistent with other studies which yielded a positive result in 68-89% of cases.^{1,6,9,10,14} Swelling of the epiglottis, classically described as the "thumb sign" may be found in as many as 71% of patients.⁵ Laryngoscopy is still the gold standard in diagnosis and should be done in all cases if possible. It is important to note that laryngoscopy did not precipitate airway obstruction in any of the patients in this study. This was consistent with the findings of Mayo-Smith *et al.* wherein none of the 364 patients seen over 18 years developed airway obstruction



secondary to laryngoscopy.¹ Leukocytosis was seen in 83% of the cases. This was slightly lower compared to studies showing leukocytosis in 91-100% of patients.^{2,8,11,14} Although the test is sensitive, blood counts are not known to be helpful in diagnosing acute supraglottitis.¹⁵

The presence of concomitant laryngeal pathology (17%), a history of thermal insult to the supraglottic structures (22%), with 22% having both conditions is suggestive that non-infectious external factors may contribute to the development of supraglottitis.

The most important aspect of management is airway protection. In this study, 5 patients were given oxygen supplementation via nasal cannula, one was intubated and one other underwent tracheostomy. Prophylactic intubation may be unnecessary in the absence of warning signs of airway compromise. Sack and Brock emphasized that the key to management is awareness of the disease and close monitoring of the airway.¹⁶ In the presence of more than 50% narrowing, intubation may be performed depending on the severity of the patient's condition.¹¹ Therefore, instead of routine prophylactic intubation, management should be focused on the patient's needs and condition.⁹

Antibiotic treatment is also necessary and should cover the most common etiologic agents. Cephalosporins such as ceftriaxone, cefuroxime, and cefotaxime have been used.^{7,9} All patients in our study were started on intravenous cefuroxime or ceftriaxone, and intravenous hydrocortisone. Corticosteroids have been used prophylactically, with conflicting findings in the literature. Some claim their use has not been found to provide reduction in the need for intubation, nor affect the total length of hospital stay.^{1,2} However, the limited number of patients in their study did not allow for a firmer conclusion regarding corticosteroid use.^{1,2}

It is advocated that patients be admitted to the ICU for close monitoring.³ However, if this is not feasible, patients may be admitted to the ward provided they are stable with an adequate airway and are being managed with antibiotics and corticosteroids. Patients in this study were observed in the ward for a median of 8 days (2-37 days). Personnel equipped with the ability to intubate or perform tracheostomy must always be available. Repeated attempts at intubation should be avoided as it may increase periepiglottic swelling causing more morbidity.¹⁶

In summary, adult acute epiglottitis should be suspected in patients who present with progressive dysphagia, odynophagia, voice changes, and throat pain especially when there is a normal oropharyngeal examination. Leukocytosis and positive soft tissue lateral radiograph of the neck may support its diagnosis and may warrant the need for laryngoscopy for confirmation. Airway protection is mandatory but

prophylactic intubation or tracheostomy are not advised. Intravenous antibiotics are necessary and corticosteroids may be of benefit.

The limitations of the study include a small sample size and few correlations and analyses on the other unusual factors that can also have effects on the development of the condition such as concomitant laryngeal pathology, thermal injuries, smoking and alcoholism.

We recommend a larger-scale, multicenter prevalence study of adult acute epiglottitis. Studies concerning other factors that may be relevant in the clinical course of the disease such as concomitant laryngeal pathology, recent thermal injury to the supraglottic region, smoking, alcoholism, and hyperemia of the pharynx are also suggested.

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