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Main Article

Acute epiglottitis in adults: a recent experience with 10 cases

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Abstract

Objectives: Our objective was to examine the presentation, clinical course and management of acute epiglottitis in a recent series of adult patients.

Method: All consecutive adults with acute epiglottitis or supraglottitis admitted to a tertiary referral centre over a recent six-month period were included in this retrospective study. The diagnosis of epiglottitis or supraglottitis was established by flexible nasolaryngoscopy.

Results: Ten patients were included. Two patients had concurrent acute tonsillitis and one had a peritonsillar abscess. Blood cultures were negative in all cases. Pathogens were isolated by throat swabs only in the two patients with acute tonsillitis. Two patients underwent intubation for management of airway obstruction. A combination of cefotaxime and metronidazole was the most common antibiotic regimen used.

Conclusion: The rising incidence of acute epiglottitis in the adult population mandates vigilance on the part of the otolaryngologist. Selective airway intervention is recommended for patients with airway obstruction of more than 50 per cent.

Key words: Epiglottitis; Adult; Haemophilus Influenzae; Intubation; Laryngoscopy

Introduction

Acute epiglottitis is a bacterial infection of the supraglottic structures, which results in the symptom complex of sore throat, stridor, odynophagia, muffled voice and high fever.[1] It is a serious infection which may be fatal secondary to sudden airway obstruction. Since the introduction of the *Haemophilus influenzae* type B (HiB) vaccine, the incidence of acute epiglottitis in children has shown a marked decline, with the current annual incidence estimated at only 0.6–0.7 cases per 10 000 per year.[1,2] In contrast, there is evidence to suggest that the incidence of acute epiglottitis in adults is on the increase, with the reported annual incidence rising from 0.79 cases per 10 000 in 1986[3] to 1.8 per 10 000 in 1990,[4] 2.02 per 10 000 in 1998[5] and 3.1 per 10 000 in 2000.[6]

Acute epiglottitis in adults has been reported to have a more indolent natural history than in children, with a reduced probability of serious airway compromise and need for airway intervention.[7] Despite this, airway intervention rates of up to 18–21 per cent have been reported.[4–6]

The purpose of this study was to review cases of adult epiglottitis at our institution and to discuss the causes behind the apparent recent increase in incidence.

Materials and methods

The present study consisted of a retrospective review of 10 consecutive patients with a diagnosis of acute epiglottitis or supraglottitis admitted under the care of the department of otolaryngology – head and neck surgery at Beaumont Hospital in Dublin, Ireland, over a six-month period between February and July 2004. The diagnosis of acute epiglottitis/or supraglottitis was established in all cases by flexible fibre-optic nasolaryngoscopy, performed by an otolaryngology consultant or specialist registrar, which demonstrated oedema and erythema of the epiglottis or supraglottis. In each case, a subjective assessment of the degree of laryngeal airway obstruction was made by the examiner (i.e. less than or more than 50 per cent). Cases with laryngeal airway narrowing of more than 50 per cent were considered to have significant airway compromise. A decision to secure the airway was made depending on the patient's symptoms and whether they had airway compromise or

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not. Demographic features, clinical history, laboratory findings, clinical course and outcome parameters were collected for all patients.

Results and analysis

There were 10 patients, seven women and three men. The mean age was 48.6 years (range 24–81 years). The duration of symptoms before hospital admission ranged from 16 hours to six days (mean 2.6 days). The main presenting symptoms were sore throat, odynophagia, fever and muffled voice (Table I).

In the majority of cases, examination of the larynx showed a swollen, erythematous epiglottis and swollen aryepiglottic folds and false folds (Table II).

Two patients simultaneously had infected palatine tonsils, and one other had a peritonsillar abscess (Table II). Supraglottic airway narrowing of more than 50 per cent was seen in two patients (Table II). None of the patients had ever received the HiB vaccine.

Leukocytosis (white cell count $> 10\ 000/mm^3$) was present in nine of the 10 patients (90 per cent). Blood cultures were obtained from four patients and were negative in all cases. Throat swabs were obtained in six patients. Growth of pathogens was present only in the two patients who also had infected palatine tonsils (*Streptococcus pyogenes* in one and *Streptococcus pneumoniae* in the other). A heavy growth of *Candida albicans* was present in another patient who also had insulin-dependent diabetes mellitus. Throat swabs showed no growth of bacteria in any of the remaining patients.

Two patients (20 per cent) had supraglottic airway narrowing of more than 50 per cent. Both required intubation and admission to the intensive care unit. One was a 50-year-old man who had been brought to the accident and emergency department by ambulance with severe respiratory distress. Examination of his larynx revealed a pin-hole supraglottic opening. He was immediately transferred to the operating theatre for intubation and examination of the larynx, and was extubated after 72 hours. The other patient was a 63-year-old woman who presented to the accident and emergency department with mild biphasic stridor and a mildly sore throat. Examination of her larynx showed an inflamed, swollen epiglottis and a narrowing of more than 50 per cent of the glottis. She was intubated immediately in the intensive care unit and extubated after eight days.

The antibiotic regimen used in most cases was intravenous cefotaxime and metronidazole. Patients were treated with intravenous antibiotics for a mean of 4.6 days, followed by a course of oral antibiotics for a mean of 7.9 days. Intravenous steroids were used in seven patients (70 per cent) for a mean of 3.4 days.

The average hospital stay was 9.2 days (range three to 40 days). One patient stayed 40 days because of medical complications (bleeding duodenal ulcer and deep venous thrombosis). Of the other patients, none had any complications and all made a full recovery.

Discussion

Historically, acute epiglottitis has been a disease of childhood.[8] However, while the incidence of childhood epiglottitis declined after the introduction of the HiB vaccine in 1985, the incidence of reported cases of acute epiglottitis in adults has shown a steady rise.[2,3,9] The current study also showed a relatively high number of cases in a short period of time.

The reasons for the apparent rise in adult acute epiglottitis are unclear. Most adults are not vaccinated against *Haemophilus influenzae* type B, as was the case in all of our patients. Nonetheless, there are increasing reports in the literature of cases of HiB epiglottitis in children despite them having an up-to-date HiB vaccination status.[1,10,11] In adults, other bacteria besides *H. influenzae* type B may cause epiglottitis, including *Streptococcus pneumoniae*, *Streptococcus pyogenes*, *Staphylococcus aureus* and *Klebsiella pneumoniae*.[12] Mayo-Smith *et al.*[7] hypothesized that these other pathogens can cause a type of acute epiglottitis, more common in adults, which is characterized by a slower onset, the absence of bacteraemia and negative blood cultures. These authors attributed the rise in incidence of acute epiglottitis in adults to non-HiB epiglottitis. However, other authors ascribed the rise to a greater physician awareness and greater availability of flexible nasolaryngoscopy.[3,13] The rise in incidence of acute epiglottitis could also be related to indiscriminate use of antibiotics, leading to the emergence and spread of antibiotic resistance.[14]

Two patients in this study required airway intervention. Our management of these two cases was consistent with current practice in most other otolaryngology centres. There is a general agreement in the literature that patients with signs of severe airway obstruction require immediate establishment of the airway either by intubation or tracheostomy.[5,12,15] Patients who lack severe symptoms but whose

TABLE I

MAIN PRESENTATIONS

Presentation	Patients (*n*)
Sore throat	9 (90%)
Odynophagia	9 (90%)
Fever (>37.5°C)	9 (90%)
Muffled voice	7 (70%)
Severe dyspnoea	1 (10%)

TABLE II

MAIN FINDINGS ON THROAT EXAMINATION

Findings	Patients (*n*)
Swollen, erythematous epiglottis	9 (90%)
Swollen aryepiglottic folds & false folds	9 (90%)
Erythematous vocal folds	2 (20%)
Infected palatine tonsils	2 (20%)
Airway narrowing >50%	2 (20%)
Peritonsillar abscess (quinsy)	1 (10%)

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airway is narrowed by more than 50 per cent (such as our second patient) also require immediate intervention, thus avoiding extremely difficult airway management during acute respiratory distress.[5,16] Patients with milder symptoms, and with mild to moderate swelling of the supraglottis, require admission to an otolaryngology ward for close airway monitoring and commencement of intravenous antibiotics and steroids. Delayed airway obstruction, occurring several days after admission, has been reported, highlighting the need for regular examination of the larynx to rule out signs of progressive airway obstruction.[6,17,18] Moreover, certain factors have been suggested as predictors of impending airway obstruction. These include dyspnoea, drooling, history of diabetes mellitus, rapid onset of symptoms and epiglottic abscess.[5,6] One of the patients in the present study who had airway obstruction requiring intubation had two of these predictors (rapid onset of symptoms (16 hours) and severe dyspnoea).

Two patients in the present study had associated acute follicular tonsillitis and one had a peritonsillar abscess which required incision and drainage. The degree of supraglottic swelling in these patients was mild, suggesting that it had occurred secondary to the oropharyngeal infection. Nevertheless, we believe that nasolaryngoscopy is indicated in every patient with acute tonsillitis or peritonsillar abscess who also has respiratory symptoms in order to avoid missing supraglottitis which could potentially compromise the airway.

Blood cultures were performed and were negative in four patients in this study. This is consistent with the low yield of blood cultures in other studies (9–15 per cent).[5,12,16] The organism grown in all of these studies was *H. influenzae*.

Throat swabs yielded growth of organisms in three patients; however, two of these had infected palatine tonsils at the time the swab was taken. The throat swab in the third patient yielded *Candida albicans*; however, this patient had a history of insulin-dependent diabetes mellitus, and it is possible that this growth may have simply represented opportunistic infection. Throat swabs were negative in all the other patients. This finding of low yields from throat swabs is consistent with those of Chan *et al.*[16] (who reported no significant bacteria isolated from throat swabs taken from 10 patients with acute epiglottitis) and Hebert *et al.*[5] (who reported 22 per cent of throat swab cultures as positive for *H. influenzae*). On the other hand, a higher rate of positivity has been reported from cultures which are taken from the surface of the epiglottis (33–75 per cent).[5,12,16] However, swabbing the epiglottis is difficult and potentially dangerous in the non-intubated patient.[19]

In adults, it is possible that acute epiglottitis is caused by other micro-organisms besides *H. influenzae*. Thus, broad spectrum antibiotics are widely used, alone or in combination with metronidazole.[16] Metronidazole is used because anaerobes are commonly implicated as pathogens in throat infections, and anaerobes have been isolated from the epiglottis in patients with acute epiglottitis.[16] We used a combination of cefotaxime and metronidazole in most of our patients, and the therapeutic efficacy of this combination has been very satisfactory.

Corticosteroids are widely used in an effort to reduce supraglottic swelling and hence the likelihood of airway obstruction. We used intravenous dexamethasone in 70 per cent of our patients, consistent with the rate of usage in other studies.[3,5,7,12] Steroids have also been used in order to reduce the length of hospital stay; however, several reported data did not support this objective.[16]

- **All consecutive adults with acute epiglottitis or supraglottitis admitted to a tertiary referral centre over a recent six-month period were included in this retrospective study**
- **Two patients underwent intubation for management of airway obstruction. A combination of cefotaxime and metronidazole was the most common antibiotic regimen used**
- **Vigilance is necessary in cases of adult epiglottitis. The authors recommend selective airway intervention when more than 50 per cent of the airway is encroached**

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