

# *Prevalence of Acute Epiglottitis and its Association with Pulmonary Tuberculosis in Adults in a Tertiary Care Hospital of Nepal*

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## **SUMMARY**

### **Introduction:**

Acute epiglottitis is a relatively uncommon disease in both children and adults. It can be a serious life threatening disease because of its potential for sudden upper airway obstruction.

### **Objective:**

To determine the prevalence of acute epiglottitis and to find out its association with Pulmonary Tuberculosis.

### **Methods:**

All cases of acute epiglottitis admitted in ENT and Head and Neck Surgery ward of TUTH, Kathmandu, Nepal, from April 2001 to September 2007, were enrolled. Routine investigations including x-rays and blood cultures were done. The patients were further investigated to rule out the presence of Pulmonary Tuberculosis. The standard treatment protocol we used included Injection Ampicillin 500 mg intravenously six hourly for 72 hours followed by oral Ampicillin 500mg for 7 days, with analgesics and intravenous steroid (Hydrocortisone 200mg) if required. Study Design: Prospective longitudinal study.

### **Results:**

Majority of the patients presented with a history sore throat (83.3%), dysphagia (78.6%) and odynophagia (78.6%). On examination all the patients were found to have swollen and congested epiglottis. Positive “Thumb sign” on plain X-ray soft tissue neck lateral view was found in almost all the patients (95.2%). Four patients presented with stridor and patient needed emergency tracheostomy. None of the investigations done to detect Pulmonary Tuberculosis was found to be positive.

### **Conclusion:**

Acute epiglottitis is a rare disease which now occurs more commonly in adults. The annual prevalence of Acute Epiglottitis in adult in TUTH is 4.8 per 1000. This study did not find any association of acute epiglottitis with pulmonary tuberculosis

### **Keywords:**

epiglottitis, tuberculosis, pulmonary.

## INTRODUCTION

An acute epiglottitis is a relatively uncommon disease in both children and adults. It is an acute inflammation of the, epiglottis, vallecula, arytenoids and aryepiglottic fold. Because the mucosa of the epiglottic region is loose and vascular, its inflammation, irritation and allergic response may rapidly cause oedema and vascular engorgement resulting in complete upper airway obstruction and sudden death. Although most adults have no sign of airway obstruction, the clinical threshold for airway intervention remain low, as it is the only way of preventing death. A high index of suspicion is needed to diagnose this rare disease and treated in hospital with intensive care facilities. Acute epiglottitis should be suspected in all patients with a history of sore throat and odynophagia, especially if symptoms are out of proportion to pharyngeal findings. In cases of adults, diagnosis can be established by mirror examination or flexible fiberoptic laryngoscopy, lateral radiography of the neck or both (1). Adult epiglottitis is different from its pediatrics counterpart in that organism identification is less common, the clinical course is more gradual, there is less seasonal variation, airway compromise is more uncommon, and conservative airway management can be contemplated in the selected patient (2).

Tuberculosis is one of the most common diseases in developing countries including Nepal. There are various forms of tuberculosis which affects different organs of our body. As this disease is one of the burden, we tried to find out whether epiglottitis is associated with tuberculosis or not. So far there were no studies done till now to find the association of epiglottitis with tuberculosis. The aim was to identify the prevalence of acute epiglottitis and its correlation with pulmonary Tuberculosis in a tertiary care hospital of Nepal.

## METHOD

This was a prospective study of all cases of acute epiglottitis (sample size (n)= 42) admitted in ENT and Head & Neck Surgery ward, T. U. Teaching Hospital, Kathmandu, Nepal over 5 ½ years period (Apr. 2001 to September 2007). All the patients with suggestive symptoms were examined and diagnosis confirmed with indirect laryngoscopy &/or flexible naso-laryngoscopy, supported by X-ray soft tissue neck lateral view. So, patients with symptoms of acute epiglottitis after confirmation with examination were included. All age groups were included. Patients suggestive of history of hypersensitivity reaction with different medicines with involvement of other adjacent structures were excluded. If all the above investigations were not done or patient not receiving the standard

regimen proposed by us, then those patients were also excluded. Ages, sex, their associations with Diabetes mellitus were noted. Routine blood, Erythrocyte Sedimentation Rate, Chest X-ray, Sputum for Acid Fast Bacilli and Moutoux test were done for all cases to find out their association with Pulmonary Tuberculosis. Blood Culture was also done for all cases. In all patients, the standard treatment protocol we used were Injection Ampicillin 500 mg intravenously six hourly for 72 hours followed by oral Ampicillin 500mg for 7 days, with analgesics and intravenous steroid (Hydrocortisone 200mg) if required. One patient underwent emergency tracheostomy by open surgical method. Data were statistically analyzed using frequency and percentage. Informed consent was taken from all patients and ethical approval was taken from the hospital to do this study.

## RESULTS

A total of 42 patients diagnosed as acute epiglottitis in T. U. Teaching Hospital between April 2001 and September 2007 (5 ½ years) were included in the study. The age of the patients ranged from 16-62 years, with the mean age being 35 years. The disease was found to be common in the second and third decades (Table 1). There were 31 males and 11 females with the ratio 2.8:1. The annual prevalence of the disease in TU Teaching Hospital was 4.8 per 1000 admitted ENT patients.

The most common presenting symptom was sore throat in 83.3% (35/42) followed by dysphagia and odynophagia in 78.6% (33/42) (Table 2). The diagnostic

**Table 1. Age distribution of patients.**

Age Group	Number of case	Percentage (%)
< 20 yrs	5	11.9%
21-30 yrs	11	26.2%
31-40 yrs	8	19.0%
41-50 yrs	8	19.0%
> 50 yrs	10	23.9%
Total	42	100.0%

**Table 2. Clinical presentation in patients with acute epiglottitis.**

Symptoms	Number of cases	Percentage (%)
Sore throat	35	(83.3%)
Dysphagia	33	(78.6%)
Odynophagia	33	(78.6%)
Fever	28	(66.7%)
Dyspnoea	10	(23.8%)
Hoarseness	5	(11.9%)

sign of the disease is swollen and/or congested epiglottis which was presented in all the patients. Stridor was present in 9.5% (4/42) patients in whom 2.4% (1/42) needed emergency tracheostomy. On X-ray soft tissue neck lateral view, positive "Thumb sign" was seen on 95.2% (40/42) cases. (Figure 1). Among the other investigations 76.1% (32/42) had raised Total Leucocyte count; 83.3% (35/42) had increased Erythrocyte Sedimentation rate 4.8% (2/42) were known diabetic however 7.1% (3/42) had high blood sugar level detected.

All the investigations done in the line of Tuberculosis (Chest X-ray, Sputum for Acid fast bacilli, Mantoux test) showed absence of Pulmonary Tuberculosis (PTB) in all the cases. The results showed no statistical significance in association of acute epiglottitis with PTB. One patient expired on the next day of admission due to septicemia secondary to pneumonitis. Blood cultures were positive in 7.1% (3/42), (*Staphylococcus aureus* in 2.4% (1/42) and gram positive bacilli in 4.8% (2/42).

## DISCUSSION

Acute Epiglottitis can be a serious life threatening disease because of its potential for sudden upper airway obstruction (3). Acute epiglottitis may be more common in adults than is generally believed, but the diagnosis is often missed (4). Male to female ratio is higher in our study. No cases of acute epiglottitis in children were admitted in our hospital during the study period. Acute epiglottitis has become a disease of adults, probably as a result of immunization of children against haemophilus influenza (5). Study by MAYO-SMITH et al showed the incidence in children dropped from 38 cases in the first 3 years of the study to 1 case in the last 3 years ( $p < 0.001$ ) (6). Adult cases increased from 17 in the first 3 years to 69 in the last 3 years ( $p < 0.001$ ) (6). Important clues that should raise clinical suspicion include fever, sore throat, odynophagia, shortness of breath and stridor. These features must be differentiated from those associated with common viral infections. The most common symptoms as quoted by FRANTZ et al were sore throat (95%) and odynophagia (94%); the most common signs were muffled voice and evidence of pharyngitis (7). Our study revealed sore throat in 83.3%, dysphagia and odynophagia in 78.6% patients.

The most helpful diagnostic studies are indirect laryngoscopy/Flexible Nasolaryngoscopy and radiography of the neck. Tenderness over the hyoid bone should raise suspicion of adult acute epiglottitis (8). Soft tissue lateral neck x-rays were abnormal in 88.1% of patients tested but had a 12% false negative rate (2). Our study had radiologically positive sign (thumb sign) in 95.2% patients. Factors associated with airway obstruction included symptomatic



**Figure 1.** X-ray Soft tissue neck showing "Thumb sign" in acute epiglottitis.

respiratory difficulty, stridor, drooling, shorter duration of symptoms, enlarged epiglottis on radiograph and *Haemophilus influenzae bacteremia* (6). The patients' airway should be monitored during evaluation to avoid obstruction. Out of the three stridor patients presented, two became better with conservative management. One (2.4%) patient needed emergency tracheostomy. And one of our patients (2.4%) died on the first day of admission due to septicemia. The patient was found to have associated pneumonitis as well. HUGOSSON et al (9) study had 0.5% (1/219) mortality rate while MAYO-SMITH et al (6) showed 0.8% mortality rate.

All medical centers should develop a protocol for the management of patients presenting with symptoms suggestive of epiglottitis (10). The illness in our center was managed using a standard management regime. The standard treatment protocol we used included Injection Ampicillin 500mg intravenously six hourly for 72 hours followed by oral Ampicillin 500mg for 7 days, with analgesics and intravenous steroid (Hydrocortisone 200mg) if required.

Awareness of the possibility of epiglottitis in adults and close monitoring of the airway are the keys to management of this potentially life threatening condition. Blood cultures were positive in only 7.1% of the cases (*Staphylococcus aureus* in one case and gram positive bacilli in two cases). Study by WONG et al also revealed three blood cultures positive (*Haemophilus influenzae* in two

cases and streptococcus mitis in one case) out of 14 cases (11). However HUGOSSON et al (9) study quoted 68% as a negative blood cultures. This reveals that a blood culture does not reveal any growth in majority of the cases of acute epiglottitis.

Since tuberculosis is very common in this part of the world, all of our patients were investigated to find out the evidence of their association of pulmonary tuberculosis. However, we could not find a single case of epiglottitis associated with tuberculosis in our study. This does not mean that pulmonary tuberculosis is not associated with epiglottitis. It is possible that, tuberculosis being a chronic illness, acute toxic features may not be the presenting features since laryngeal involvement is always secondary to pulmonary tuberculosis. A high index of suspicion is needed to diagnose this rare disease accurately and patients should be admitted to a hospital along with the intensive care facilities to reduce mortality rate.

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## CONCLUSION

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From our five year long study we came to a conclusion that acute epiglottitis is rare disease with its prevalence rate being 4.8 per 1.000 admitted ENT cases. The epidemiology of acute epiglottitis has been changing significantly, which now occurs more commonly in adults along with a lower incidence of Haemophilus influenza involvement and in majority of patients blood culture is not helpful. This study did not find any evidence of pulmonary tuberculosis in the patient who had presented with acute epiglottitis.

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