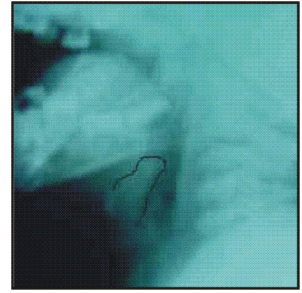


CASE REPORT

PROF-919

ACUTE EPIGLOTTITIS



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ABSTRACT..... A case of acute epiglottitis is presented here. The patient was in severe respiratory distress. He was intubated and managed in general ICU. He made good recovery. ICU management and special consideration of this disease are discussed.

Key Words: Acute Epiglottitis, Upper Airway Obstruction, Intubation ,ICU Management

INTRODUCTION

Opening and maintaining the airway is fundamental to the treatment of all emergencies in paediatric as in adults. The commonest cause of pediatric airway obstruction is still the child with depressed conscious level who is not positioned properly or airway is not opened adequately by basic life support manoeuvres¹. Large airway obstruction is a life-threatening situation, which demands rapid and effective actions by the physician facing this situation. There are various causes of large airway obstruction in children; among them the commonest are foreign body and infective causes¹.

The pattern of infective causes has changed since introduction of vaccination programs against Haemophilus influenza type B^{1,15}. There has been reduction in incidence of epiglottitis with relative

predominance of viral croup and bacterial tracheitis, usually caused by staphylococcus aureus. Prevalence varies widely by geographic location². Various reports have shown an incidence of 6 cases per 100,000 people^{6,9,11}. Acute epiglottitis is still encountered occasionally and more so in underdeveloped countries where vaccination programs are not effectively enforced

CASE REPORT

A fourteen months old boy was brought to casualty department in the evening with difficulty in breathing. The frightened parents told us that child was unwell since morning. They were using cough syrup and erythrocin syrup as prescribed by casualty medical officer in the morning shift. The child was confused, restless, dyspnoic, having inspiratory stridor and using accessory muscle of respiration. He preferred to sit up in mother lap

and was unable to cough and cry. Pulse was 175/min, respiratory rate 40-45/min spO_2 on air 93% and temperature 104F.

There was no H/O foreign body ingestion or any such previous attack. Past medical history was unremarkable. Keeping in view patients clinical condition and short duration of onset provisional diagnosis of acute epiglottitis/group was made. The child was shifted immediately to operating theatre under the supervision of anaesthetist. He was nebulised with one mg adrenaline, cefotaxime 500 mg i/v and dexamethasone 4mg i/v given keeping in view the diagnosis. In the meantime patient condition deteriorated, his pulse 190/min, spO_2 95%, on 8L/min oxygen. Severity of dyspnoea increased to extent that he started getting drowsy. At this stage decision to intubate the child was made. Anaesthesia was induced with Inhalational induction, halothane with 100% oxygen. It took much longer time to get adequate depth of anaesthesia for intubation. On laryngoscopy epiglottis was red angry looking and enlarged in size. Intubation was done with size 4 non cuff endotracheal tube which passed with using slight force indicating subglottic oedema. In practice this child would have easily been intubated with size 4.5 non cuff endotracheal tube. His breathing improved significantly, respiratory distress disappeared and child started breathing spontaneously, supporting our diagnosis. Swab from the throat was sent for culture and sensitivity along with blood for complete picture and culture and sensitivity.

Child was kept spontaneously breathing sedated with midazolam 0.1 mg and pethidine 2 mg as required basis. More frequent doses were required initially and frequency decreased to once every four hours after eight hours. Our aim was to keep child spontaneously breathing, responsive to verbal command and tolerating endotracheal tube. He was monitored with pulse oximeter, NIBP and ECG were unable to meet our aim at times. Saturation dropped below 90% quite number of times, over-sedation and under-sedation happened quite frequently. Problems were managed by giving humidified oxygen 4L/min, supporting breathing by

paediatric ambu bag and sedating or withholding sedation. Our major problem remain the blockage of endotracheal tube. In spite of repeated suctioning and giving humidified oxygen endotracheal tube got blocked which led to accidental extubation by child himself after 12 hrs of intubation. Reintubation was done immediately with same size tube. Cefotaxime 125mg continued 6 hourly. Child was nebulised with normal saline every 30 minutes. He became afebrile after about 10 hours of intubation. Easy movement of endotracheal tube observed after 16 hours of intubation and there was leakage of air around the tube. After giving normal saline nebulisation child was extubated 20 hours after intubation. He remained in ICU for another 12 hours for observation and then shifted to paediatric ward. He was discharged from hospital after spending about 36 hours in the ward.

DISCUSSION

Epiglottitis is a short lived disease that usually presents with characteristic signs and symptoms. At times classic signs and symptoms are not present and it may be difficult to differentiate epiglottitis from laryngotracheobronchitis also known as croup.

Group		Epiglottitis
Cause	Viral	Haemophilus influenzae B
Age	6m – 3y	2 – 6y
Onset	Gradual	Sudden
Pyrexia	Mild	> 38
Abnormal sounds	Barky cough, Stridor	Muffled, guttural cough
Swallowing	Normal	Very difficult with drooling
Posture	Recumbent	Viral
Facies	Normal	Viral

Epiglottitis can be fatal if upper airway obstruction is not treated promptly. This is one of the few life threatening condition in which physician has to depend on his clinical judgment alone and proceed with effective treatment.

Waiting for investigations and clinical misjudgment can prove fatal. Most important task in this scenario is to assess the severity of airway obstruction and take appropriate measure to establish clear airway².

SIGN & SYMPTOM

Classically, children with epiglottitis are 2 to 6 years of age but age may vary as in our case age of the child was 14 months. They presents with history of acute difficulty in swallowing as well as high fever and inspiratory stridor. These signs and symptoms have usually developed over a period of less than 24 hours. There may be excessive drooling, a muffled voice and characteristic posture of sitting upright and leaning forward(tripod position)³⁻⁶.

ASSESSMENT OF BREATHING

The increase in effort of breathing caused by airway obstruction may produce an increase in respiratory rate for age. A rate >50bpm in an infant and >30 in a child may be considered abnormal .However ,of even more concern would be respiratory distress associated with normal respiratory rate, bradypnoea or apnoeic spell which indicate decompensation and exhaustion.A see-saw pattern of chest and abdominal breathing movements is seen in airway obstruction. Recessions of intercostal spaces, subcostal region and sternum are also seen in young infant and reflect the forces generated by vigorous contractions of diaphragm and the compliant chest wall. Use of accessory muscles of respiration (sternomastiod, scalene muscles and intercostals) is associated with tracheal tug, supra-sternal and supra clavicular recessions and nasal flaring. Lack of effort associated with deteriorating conscious level may indicate exhaustion and de-compensation.

Stridor during inspiration is usually a sign of airway obstruction at supraglottic or laryngeal level but can also occur in tracheal obstruction. The volume of stridor or wheeze does not correlate with the degree of airway obstruction.Indeed most ominous sign is the "silent chest" where obstruction is so sever that no gas flow is occurring⁴.

WHAT INVESTIGATION ARE HELPFUL?

The assessment of the child in order to identify and manage airway obstruction is a clinical one. Do not try to examine the child throat.The pulse oximeter is a very useful, non invasive and atraumatic monitor of arterial oxygen saturation and heart rate. Radiology should not be used in the child in extremes before intervening but in less acute cases may help in diagnosis such as thumb sign in epiglottitis in lateral neck x-ray.It should be carried out at bedside and child must not be moved to x-ray department. MRI and CT has no place in emergency airway management but they are very helpful in diagnosis of less acute airway problem.The process of obtaining arterial or venous blood gases is likely to cause undue stress which will worsen airway obstruction.In obtunded child intervention should be immediate and should not wait for blood gas result For less severe cases trend in CO₂ level, PH and O₂ values may be helpful in guiding treatment and reinforcing the need to intervene^{5,7}.

MAKING THE DIAGNOSIS

Some feature of the history and examination may be particularly helpful in pointing to specific diagnosis. However in this situation reaching to diagnosis is less important as far initial management of patient's concern, so looking for diagnosis must not delay the initiation of treatment. In some cases diagnosis is not made until laryngoscopy is performed⁷.

VENOUS ACCESS

It is often stated that attempt to venous access should not be made as it will upset the child -this is a reasonable view. However some argue that in the less ill child and with topical local anaesthesia or ice analgesia and a skilled paediatric venepuncturist,this is not an issue.Some experienced paediatric anaesthetist are of the view that, in the hypercarbic, obtunded child with hyperdynamic circulation, establishing venous access is relatively simple and appropriate. Despite this debate,the classical approach of not attempting venepuncture is recommended for non-specialist anaesthetist⁴.

SECURING THE AIRWAY

Immediate intervention is required in apnoeic or exhausted child and If child is making ineffective respiratory effort. A silent chest or no stridor are very sinister signs, indicative of complete airway obstruction. Endotracheal intubation remains gold standard to secure the airway in this situation, there are other time buying procedures which can be adopted, I will discuss only endotracheal intubation here and leave the other methods for next article.

Child should be shifted to operating theatre, most experienced anaesthetist available must be called in. This case is not for trainees or inexperienced registrars. A person experienced in performing tracheostomy should be available in operating theater. Gaseous induction with sevoflurane in oxygen is method of choice, however halothane is also acceptable. Induction should be given about 10 minutes more than one normally given to this age group because of air way compromise, it will take longer to achieve acceptable depth of anaesthesia for intubation. Venous access should be obtained after child has been induced but before endotracheal intubation. Ideal condition for intubation should be achieved by deepening level of anaesthesia and under no circumstances muscle relaxant of any sort be used. Endotracheal tube at least a size smaller than for that age group will most probably be required, however different sizes must be available. Laryngoscopy will confirm the diagnosis as red cherry enlarged epiglottis which may make intubation difficult. In exceptional circumstances when intubation is not possible repeated attempts at intubation should not be made and one should resort to tracheostomy¹⁴.

FURTHER MANAGEMENT

Patient should be relaxed, sedated and ventilated initially to give rest to exhausted child. Latter on depending upon facilities available child can be kept on spontaneous breathing with adequate analgesia/sedation keeping in mind possibility of respiratory depression and inadequate oxygenation which may happen because of small diameter endotracheal tube. Accidental extubation and

respiratory arrest remain the two dreadful complication of this type of approach. These can be avoided by meticulous nursing care, proper fixation of endotracheal tube and intermittent positive pressure ventilation on as required basis. We use this approach in our patient. In spite of all possible precautions there was once accidental extubation after 12 hrs of intubation and child was reintubated in ICU immediately. The other most frequent problem was blockage of endotracheal tube, repeated suctioning was done through endotracheal tube by small size suction catheter. Though humidified air/O₂ was used, blockage of tube was more frequent than we expected. This can be attributed to very small size of endotracheal tube (size 4). The other approach which involve elective control ventilation was not adopted due to lack of facilities and experienced nursing staff. Usually intubation is required for 12 to 24 hrs .when fever has settled down and there is audible leakage around the tube, this is time to think about extubation which can be accomplished when child is fully awake and analgesia has been stopped well ahead of this time Rest of general care of patient is on the same line as would be any patient of this age group.

Mortality is zero if diagnosis is made in time and those requiring intubation are intubated. It is clear from the data that there is delay in diagnosis in 9 to 18% of cases. There is 6% mortality in cases who were treated medically without intubation. This gross difference in mortality strongly advocate intubation whenever it is required. Early involvement of anaesthetist in airway compromise patient can save many valuable life²³. Acute epiglottitis is uncommon disease in our community and awareness about this disease is more uncommon. Cases do occur off and on, high index of suspicion is required on part of physician looking after this age group of patients.

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