

FOREIGN BODY ASPIRATION IN CHILDREN

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ABSTRACT

A case series descriptive study, was carried out from September 2007 to September 2010 at Paediatrics unit Sheikh Zayed Hospital, Rahim Yar Khan, Pakistan. The aim of the study was bronchoscopic evaluation of children suspicious of inhaled foreign body (FB) such as beetlenut, seeds, peanuts, tiny objects and fragments of tooth and presented with persistent cough.

Forty (n=40) children (male & female) in age range of 1-3 years (toddlers) presented with persistent cough with no history of foreign body (FB) aspiration were included. The chronic persisting cough was defined as cough lasting for 30 days or >30 days as guided by WHO. They had bouts of cough mimicking pertussis and had clinical findings of decreased air entry with rales and rhonchi. Oxygen saturation was monitored by pulse oxymetry. X-rays chest were obtained. The pulmonary tuberculosis, pertussis and other chronic lung diseases were ruled out by history, clinical examination and investigations available in hospital laboratory. The cases with suspicion of FB inhalation were subjected to bronchoscopy. Rigid broncoscope was an essential tool for investigation and removal of FB in study. The data were processed in soft wear SPSS 16.

Male: Female ratio was 2:1 and had height and weight above 10th percentile and vaccinated as per EPI schedule. The clinical examination of chest revealed dull or hyper resonant, decreased or no air entry with or without rales and rhonchi on the side of chest where FB lodged the lung. X-rays chest had no radio opaque FB, hyper inflation in cases 15 (n=15) and collapse in 10 cases (n=10) were the main findings. The clinical and radiological findings supported the empirical diagnosis of foreign body aspiration (FBA) and these children underwent rigid bronchoscopy. Bronchoscopically visualized FB were retrieved and the air ways were cleared of inflammatory debris and pus. The oxygen saturation returned to normal and marked clinical improvement occurred soon after bronchoscopy. The commonest FB in our study was the beetle nut (Chalia / Supari). The radiological changes were also seen after bronchoscopy.

FBA should be considered in children presenting with persisting cough and after thorough clinical and radiological examination the suspected cases be evaluated by rigid bronchoscopy.

Key words: FB, Children, Persistent Cough, Bronchoscopy

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INTRODUCTION

Foreign body (FB) inhalation in tracheobronchial tree is seen commonly in children. The life threatening incident could be linked to the inherit nature of human baby to intrude and put the objects in mouth, as an earliest activity of life. The craze of tasting edible or inedible items in their surroundings increases as they start crawling. The toddlers are vulnerable to inhalation of objects due to erupted molar teeth, less chewing and underdeveloped oropharyngeal reflexes.¹

The inhaled objects may lodge in small air ways of children particularly right bronchus depending upon the nature and dimension of FB. Aspiration cause acute critical asphyxia, choking and respiratory distress or persisting cough (cough lasting >30 days).² The parents are usually unaware and history of inhalation is not present in prolonged wedged FB and immediate choking events are missed by parents or other caregivers.³ Therefore the late symptom of cough is taken as a mild acute respiratory tract infection (ARI). Pneumonia, atelectasis, abscess, emphysema, pneumothorax, asthma-like wheezy chest and persisting cough like whoop are squeale of FB inhaled into small airways of children.⁴ The pertussis like cough presents with bouts, typical of whoop, apneic spell and hypoxemia induced seizures. These conditions are masquerading the FB and under diagnosis delays the removal of FB which can lead to fatality in children.⁵ The laboratory and radiological investigations are not helpful in non-metallic organic FB like peanuts, beetlenut (supari, chalia) and seeds.⁶ Bronchoscopy is the best intervention for diagnosis and removal of FB.⁷ Rigid bronchoscopy under general anaesthesia (GA) is recommended in children but flexible bronchoscopy is less invasive, more informative and done without GA. The nonavailability of otolaryngologist and pediatric bronchoscope at most of District Headquarter Hospitals (DHQ) in this country address the earliest referral of suspected children to tertiary care centers. A high index of suspicion is necessary in children, not responding to treatment of persisting cough.⁸ The prevention of FB needs the creation of awareness among parents and caregivers of the children. The inhale able objects be kept away and edible items with risk of aspiration be avoided.

METHODOLOGY

Forty (n-40) children of both sexes (male and female) in age group of 1-3 years with Male: Female of

(2:1) with mean age of 1.92 ± 0.608 yrs std were admitted in pediatrics' unit with history of persisting cough and chest finding suggesting suspected FB aspiration, were included in study. The children with contact of tuberculosis and pertussis, wheezing since infancy, family history of asthma acute respiratory tract infection (ARI), clinically suspected cases of chronic lung disease and aspirations like post-operative and kerosene oil inhalations were excluded. The demographic data, vaccination status, anthropometric measures, and chest findings were recorded in a proforma. The investigations included CBC, ESR, culture swabs of nasopharynx, X-rays chest posteroanterior (expiratory including abdomen), lateral and TB ICT. Blood gas analysis were obtained and continuous monitoring of oxygen saturation by pulse oxymetry was performed. Thirty five (n-35) children were subjected to bronchoscopy after getting consent of parents and discussion with anesthetist.

RESULTS

Among forty children (n-40), thirty-five (n-35) had persisting paroxysmal cough and breathlessness for the last 1-3 months, five (n-5) had episodes of cough and intermittent fever for the last 3 weeks. None of the parents were aware of FB aspiration and had not witnessed the choking event in the past few days. The

TABLE 1: RADIOLOGICAL FINDINGS

X-ray chest	Cases	%age
Hyperinflated lung	15	37.5
Collapse	10	25
Consolidation	05	12.5
Infiltrations	04	10
No findings	06	15

TABLE 2: FB ASPIRATED

F.B.	Cases	%age
Beetle nut (Chalia / Supari)	20	57.1
Nimko chunks	05	14.3
Peanut	04	11.6
Maize seeds	04	11.6
Battery	01	2.8
Potato Beetle	01	2.8

clinical examination of chest revealed, hyperresonance, decreased air entry, rales and few rhonchi on right chest in twenty cases (n-20). The seven (n-7) had similar findings on left chest. The seven (n-7) had no specific findings except tachypnea. The five (n-5) had bilateral rales and rhonchi. All children had no or meager response to antibiotics and bronchodilators. Steroids were prescribed to ten (n-10) children before admission. Blood count, ESR, sputum reports ruled out tuberculosis and pertussis. Lung function tests like spirometry were not possible. Oxygen saturation in 10 cases (n-10) was < 80%. X-rays chest both PA&Lat view yielded hyperinflation, opacities and collapse of affected lung, as given in Table 1. Thirty-five cases were selected for bronchoscopy. The FB were visualized in thirty cases



Fig 1: Hyper inflated left lung. Mediastinum shifted to Rt



Fig 2: FB Retrieved from left lung

(n-30) and FB retrieved from right bronchus in twenty cases (n-20) and from left bronchus in seven cases (n-7) and three (n-3) had impacted FB pieces in 2nd generation bronchi.

The foreign bodies removed are shown in Table 2. The oxygen saturation improved as soon as the FB were removed. The children recovered of respiratory distress and air entry in affected lungs improved. X-rays chest findings were changed remarkably in one case (Figures 1 & 2). A child developed apnea and brain anoxia and bronchoscope was performed as a high risk case. Pieces of beetlenut (Supari) were retrieved. He was kept on ventilator but expired. Other children had no complications on follow-up.

DISCUSSION

FB aspiration exists as a worldwide medical emergency leading to high mortality if not dealt promptly and timely. The data is lacking in Pakistan but FB aspiration has led to 7% of all accidental deaths in

under 4 yrs children in US and mortality rate in a study in India is 1%.⁹ This study has, indeed pointed out FBA as a hidden and less recognized underlying cause of chronic cough in children. The delay in diagnosis could misguide a clinician and may lead to unwise decisions like prescription of steroids, prolonged antibiotics and anti TB drugs. Male toddlers were main victim of aspirations in this study as also recorded in other studies.¹⁰

Parents were unaware of immediate symptoms after inhalation. Choking is the commonest first response of impaction of FB in the tracheobronchial tree but it may be for such a short span in some cases as unnoticed.¹¹ The witnessing of choking event is important clue for early diagnosis, however studies have discussed unawareness in 50% of cases of FBA.¹² The children are usually left alone or handed over to either elder sister or old grandmother who cannot follow these toddlers when they run around and can introduce an object in mouth and inhale it unintentionally during laughing or crying, depending upon the nature of the substance also. The FB on lodging invokes the inflammatory reaction which is manifested as cough. The cough always needs medical attention. The cough has been said chronic when it remains for a period of > 8 weeks.¹³ But in present study WHO definition of cough was followed i.e. cough of 30 days or more to be called as chronic. The children in the study cases presented cough in bouts vomiting after cough, apneic and synoptic attacks and therefore were mistaken as pertussis.¹⁴ The delayed diagnosis in these cases was due to underestimated symptom of cough and they were admitted with respiratory distress, apnea and convulsions. X-rays chest were unyielding for location of FB and whether they were organic, vegetative or non metallic in nature. Despite the symptoms of pertussis-like cough, the decreased air entry on affected side of lung in children in the study, was a significant finding suggestive of FBA. Radiological findings like, collapse, hyperinflated lung, mediastinal shift and haziness are also suggestive of FBA as also seen in other studies.¹⁵ CT scan of the chest is also conclusive. But once a case of FBA is admitted in tertiary care, immediate plan of intervention is advised in collaboration with otolaryngology and anesthesia department.

Rigid bronchoscope is the recommended investigatory tool for visualizing and retrieving FB in children.¹⁶

Peanut was the commonest FB recovered in many studies¹⁷. Beetlenut (Chalia) was removed in 60% of cases in the present study. Chalia is sold in small sachet at school tuck shop and brought to home by the elder siblings. In 66% of cases FB were recovered from right bronchus, which is in consistent with other studies. Peanut was the commonest FB in other studies, yet it depends upon the substances available in the vicinity of a child, the opportunity and look after. The dice and fragments of tooth or filling have been retrieved from children tracheobronchial tree.¹⁷

The interested and different foreign body in this study was the potato beetle, retrieved in fragments. A one year toddler crawling on the ground picked it up and put it in mouth as an innocent act. Such type of aspiration indicates the poorly protected environment of children in Pakistan due to lack of knowledge, large family size and overburdened mothers in this community. The parts of plastic toys were inhaled by children in studies from developed countries.¹⁸

Recommendations for prevention of FBA in children, highlighted in medical literature should be framed.¹⁹ The awareness of protected environment for children to avoid accidental emergencies should be addressed by media like TV. Beetle nut (Supari) retrieved in other studies remained at the top FBA in children.²⁰ Ban on the sale of Supari be implemented by authorities as it causes damage to teeth and oral mucosa also.

CONCLUSION

FBA should be kept in differential diagnosis of persistent cough in children and bronchoscopic examination is an essential step for diagnosis and management in a child suspected of having inhaled a foreign body.

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