Original Article

Frequency of tracheobronchial foreign bodies and their management in urban population of Sindh

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Abstract

Objective: To assess the common foreign bodies in urban areas of Sindh, and the presentation, problems and complications during their removal through rigid bronchoscopy.

Methods: The descriptive study was conducted at the Ear, Nose and Throat Department and the Department of Head and Neck Surgery of Liaquat University Hospital, Hyderabad, and Abbasi Shaheed Hospital, Karachi, from April 2009 to October 2010. Fifty patients with strong suspicion of foreign body inhalation in whom rigid bronchoscopy was done were included in the study. A definitive diagnostic protocol was applied and rigid bronchoscopy was done to search and remove the foreign bodies. The data was fed into SPSS version 15 for descriptive analysis.

Results: In our study,28(56%) cases were male and 22(44%) were female. The age range was 1-7 years. Most of the victims (n=21; 42%) were over 3 years of age. Commonest symptom of presentation was dyspnoea (n=34; 68%) and the commonest sign of presentation was decreased unilateral air entry (n=25; 50%). Most of the foreign bodies were impacted in the right main bronchus (n=26; 52%). The most retrieved foreign body was betel nut (n=23; 46%). The commonest complication of bronchoscopy was airway oedema which occurred in 13 (26%) patients. The successful removal of exogenous foreign body was achieved in 41 (82%), and the mortality rate was 3 (6%).

Conclusion: Delay in the diagnosis of foreign body inhalation translates into a higher risk of complications. Therefore, early bronchoscopy should be done on suspicion. Early recognition at both parental and clinical levels should be promoted through public awareness.

Keywords: Foreign bodies, Rigid bronchoscopy, Early diagnosis. (JPMA 62: 896; 2012)

Introduction

As opposed to the ingested foreign bodies which gain entrance into the digestive tract, inhaled foreign bodies find their way to get lodged into the tracheo-bronchial tree. Although foreign body inhalation into the air passages cannot be claimed a domain of a particular age, but nearly 80% of these accidents are encountered in the paediatric age group.[1] Among the paediatric patients, children between the ages of 12-48 months have been found to be the major victims owing to their poor chewing ability because of the lack of posterior dentition, a tendency to put things into mouth, and a tendency to have frequent vigorous, uninhibited inspirations when startled, laughing or coughing.[2] Similarly, the spectrum of inhaled foreign bodies is varied and the majority is organic in nature, mainly food items. The spectrum of the types of inhaled foreign bodies may be explained by the cultural, regional and feeding habits in different parts of the world.[3] Hence, peanuts are found to be the major offenders in Western countries and melon seeds are the main culprits in Arab countries due to their social habits.[3]

Inhaled foreign bodies in the tracheo-bronchial tree can be removed by bronchoscopy, both by rigid as well as flexible scopes. However, rigid bronchoscopy offers good visualisation and is the preferred method for foreign body removal.[4] Historically, first rigid bronchoscopy was done in 1897 by Killian to remove a piece of pork bone from the right main bronchus[5] and after about a century, the first flexible bronchoscopy was done in infants and children in 1978.[6]

This study set out to highlight the various inhaled paediatric foreign bodies common in urban areas of Sindh, their presentation and management; and to compare it with other studies in world literature.

Patients and Methods

The descriptive study was conducted from April 2009 to October 2010 simultaneously at the Departments of ENT and Head and Neck Surgery, Liaquat University Hospital, Hyderabad, and the Abbasi Shaheed Hospital, Karachi. Fifty patients with strong suspicion of foreign body inhalation into their airways and in whom rigid bronchoscopy was done, were included in the study. All the patients were assessed through a definitive protocol, including history (inhalation/cough/transient cyanosis), physical examination (decreased unilateral chest movements/auscultation), routine laboratory tests and radiological investigations (X-ray chest/C.T. scan, if required). However, radiological investigations could not be done in cases where it was thought that delay might lead to mortality. In such cases, bronchoscopy was initiated on an emergency basis, simply relying on brief history and physical examination. Finally, all the data was fed into SPSS version 15 for descriptive analysis.

Results

Of the 50 patients, 28 (56%) were male and 22 (44%) were female; with a male preponderance of (1.27:1). The age range was 1-7 years: 19 (38%) were in

Table-1: Clinical features of the patients.

Presentation	Frequency	Percentage
Symptoms:		
◆ Dyspnoea	34	68%
◆ Acute respiratory distress with cyanosis.	5	10%
◆ H/O Choking	5	10%
◆ Persistent unresolved cough	4	8%
◆ Whistling sound on cough/Breathing	2	4%
Signs:		
◆ Decreased unilateral air entry.	25	50%
◆ Wheeze bilaterally.	15	30%
◆ Stridor.	5	10%
◆ Emphysematous changes.	5	10%

Table-2: Spectrum of foreign bodies.

Foreign Bodies	Frequency	Percentage
Betelnut	23	46%
Peanut	5	10%
Whistle	3	6%
Plastic Toy Ball	2	4%
Gram Pulse	2	4%
Small Metallic Button	2	4%
Metallic Screw Nut	1	2%
Stone	1	2%
Maize Grain	1	2%
Rice Grain	1	2%
Mucous Plugs	9	18%
Total	50	100%

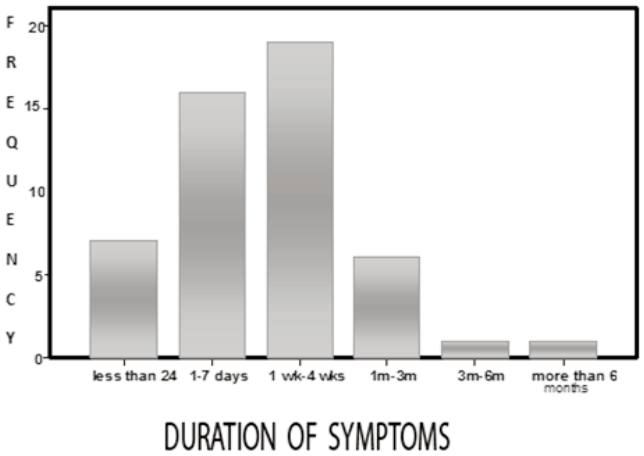

Figure: Duration of symptoms.

the age group of 2-3 years; 10 (20%) were below 2 years; and 21 (42%) were over 3 years of age. The commonest symptom of presentation was dyspnoea, 34 (68%). Decreased air entry on one side of chest was the main sign on physical examination, 25 (50%) (Table-1). As regards the time of presentation, 19 (38%) presented in 1-4 weeks, followed by 16 (32%) who presented in 1-7 days (Figure). Radiological study of the chest showed patchy consolidation in 12 (24%) cases. Forty (80%) cases had foreign body in either bronchus; the most common site of impaction was the right main bronchus which accounted for 26 (52%) cases. Bilateral incidence was noted in only 5 (10%) cases. The most retrieved foreign body was the betel nut, 23 (46%) cases (Table-2).

In 41 (82%) cases, the exogenous foreign body was removed, while in the remaining 9 (18%) cases, thick mucus plugs were sucked out resulting in restoration of the airway. The commonest complication of bronchoscopy was airway oedema which occurred in 13 (26%) patients. We lost 3 (6%) patients during the procedure; one died of severe and intractable bleeding from the granulations around the foreign body, and two patients died of lung complications.

Discussion

The preponderance of male children among the victims is understandable because of the rougher, more adventurous, curious and inquisitive nature of boys than the girls.[8] A study has maintained 70% male preponderance to be a fixed mathematical constant of nature.[9] As regards the nature of the aspirated object, the majority of aspirated objects are organic in nature, mainly the food items. And the types of foreign bodies vary according to the cultural, regional and dietary habits.[3] The most retrieved foreign body in our study was betel nut (46%), which was found by an earlier study to be 65.6%.[10] Peanut was the most retrieved (45%) foreign body in one series,[5] while another one found it to be 55%.[11] Similarly, melon seed was the most retrieved (70%) foreign body in one series.[12] Fisfis seed (33%);[9] fish bone, 15%;[13] and beans, 24%.[14]

As regards the enlodgement of the foreign body in the right or the left bronchus, one study reported that the angle made by the main stem bronchi with trachea was similar up to the age of 15 years resulting in the foreign body to lodge on either side with equal frequency.[4] After the age of 15 years, the right and left main bronchi diverge at very different angles from the trachea in such a way that the right mainstem bronchus gets more in line with the trachea. But most studies have taken a contradictory position in this respect, claiming a right-sided predilection. The current study found the right main bronchus to be the most common site of impaction (52%) with another 10% having a bilateral placement. Other renowned studies have also reported right-sided predilection to be 74%, 67.5% and 67%.[4,13,10] However, cases insisting on central arrangement are reported sporadically in world literature. Patients with suspected foreign bodies in airways have different presentations. Difficult respiration was the commonest symptom in our study which was noted in 68% of the patients was as also reported in an earlier study.[13] Persistent cough was the commonest symptom in some other studies.[3,10,15] Unilateral decreased air entry was the commonest sign in our study which was noted in 50% of the cases. One early study found it to be 69%.[15]

A plain radiograph can detect radio opaque foreign bodies readily, but in cases of foreign bodies, secondary changes like atelectasis and obstructive emphysoema are helpful at least in suspecting an inhaled foreign body. In emergency situations, obtaining a radiograph is not always possible or rather dangerous from mortality point of view. In our study, the commonest radiographic finding was patchy consolidation which was noted in 24% of the cases. Other such findings in two studies obstructive emphysoema in 31.9 % and 52.5%of the patients,[3,15] atelactasis was the commonest radiographic finding in another study (18%).[9]

Since bronchoscopy is also done on suspicion and to locate a foreign body. Also sometimes the foreign body is badly impacted due to its large size, mucosal oedema and granulations around it. Therefore, different complications are inevitable in such cases. Complications in our study were rare and minor. The commonest complication was mucosal oedema (26%) which was in line with available literature.[4,15]

Mortality is an ever frightening accompaniment of bronchoscopy with different contributing factors. Among the most important of these factors are included the under-estimation of the seriousness of the problem by the parents, delay to perform bronchoscopy, and lack of expertise on the part of the surgeon and the anaesthetist. Prolonged presence of foreign body in the airway can lead to irreversible changes in the lungs which increase morbidity and mortality. In literature, we could find the mortality rate during bronchoscopy ranging from 0.2% to 6.4%.[13,16-18] We lost three patients in our study; two due to severe acute respiratory distress with cyanosis and attendant cerebral anoxia; and one due to profuse intractable haemorrhage from the granulations around an impacted foreign body. This constituted the mortality rate in our study to be 6%. The reason behind all the three mortalities was under-estimation of the gravity of the

problem by the parents and lack of diagnosis by the attending general practitioners who delayed referral to the otolaryngologist for early diagnostic/therapeutic bronchoscopy by mistaking the condition as asthma and respiratory tract infection.

Conclusion

Early recognition of the symptoms on the part of parents and quick detection of tracheobronchial foreign bodies hold the key to in-time bronchoscopy that can decrease morbidity and mortality in such patients. This can be achieved through enhanced public awareness through mass media; and continuing medical education (CME) for general practitioners.

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