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Original Article

TRACHEOBRONCHIAL FOREIGN BODIES: A REVIEW AND ANALYSIS DURING PAST ONE YEAR AT CHILDREN'S HOSPITAL, PIMS, ISLAMABAD

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ABSTRACT:

Objective: In view of changing patterns, to identify most common type of foreign bodies in tracheobronchial tree of children. To make recommendations for appropriate measures to prevent the incidence of inhalation.

Design: This descriptive study was carried out between April 2001 to March 2002 on 108 children.

Setting: Department of Pediatric Surgery, Children Hospital, Pakistan Institute of Medical Sciences (PIMS), Islamabad.

Results: We studied 108 patients out of whom 68 were male (63%) and 40 were female (37%). The mean age was 3.97years. Most common symptoms were dyspnoea in 88 (81%). 35 patients (32%) had insignificant X-ray findings. 65 patients (60%) had hyperinflation. 3 patients (2.7%) had atelectasis. One patient had bronchiectasis, one with emphysematous change and one had pleural effusion. The most common organic foreign bodies 28 had pieces of peanuts (26%) and next most common 11 had beetle nuts (10%). Most common inorganic foreign bodies 26 in our series was a whistle (24%), followed by 13 metallic rings (12.2%), metal nails, safety pins, pallets, watch batteries and ring stones.

Conclusions: Aspiration of foreign body into tracheobronchial tree in children carries a high risk to life but adequate and prompt treatment is associated with very low mortality. Health care education is the key to prevention. Industrial manufacturing laws with regard to quality control and safety of production of various toys to which children are commonly exposed should be forcefully implemented.

KEY WORDS: Foreign body tracheobronchial tree, recent introduction "a Whistle".

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INTRODUCTION

Foreign body aspiration is a common problem in children[1] and the most common cause of accidental death at home in children under six years of age[2]. In the developed countries, almost 300 to 600 children under 15 years of age die every year following aspiration of foreign bodies[3]. Unfortunately these patients rarely reach a doctor in time for intervention. One third of all foreign body aspirations go unrecognized. The type of foreign body inhaled depends on the area and types of objects that the children most commonly come in contact[4]. In underdeveloped countries, there are no available statistics regarding the contribution of type of foreign bodies, which may be the major cause of death. This is probably due to the fact that many patients never reach the hospital and succumb at home; many remain unsuspected and detected and suffer from serious long-term complications. The successful

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diagnosis and treatment of this problem requires awareness and highest degree of suspicion of the signs and symptoms of foreign body aspiration[5]. This paper looks at the local experience of the most common objects which are inhaled by children and those which result in serious complications. Important recommendations and suggestions are proposed to reduce the incidence and for the better management of this accident.

PATIENTS AND METHODS

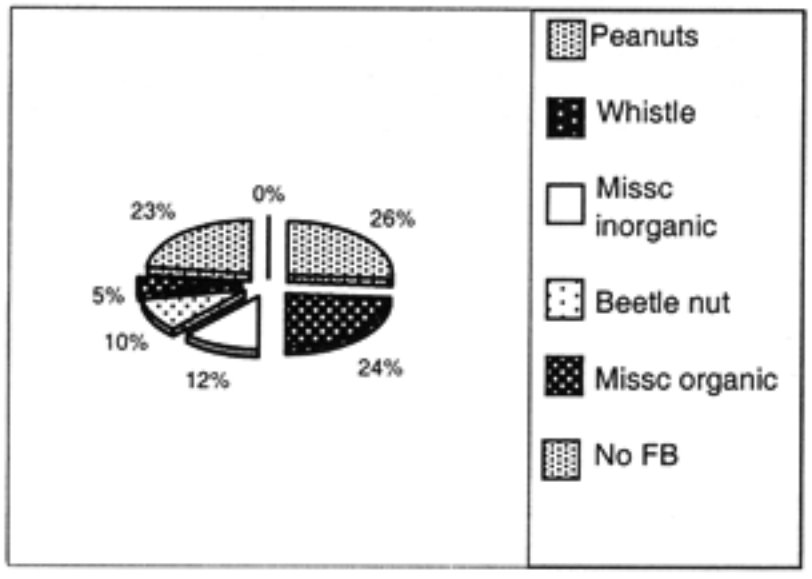
This descriptive study of the foreign body inhalation in the tracheobronchial tree carried out in the Department of Paediatric Surgery, Children Hospital, Pakistan Institute of Medical Sciences, Islamabad. The patients were drawn from Punjab, NWFP and Azad Kashmir. During the period between April 2001 to March 2002, 108 patients were admitted with the diagnosis of foreign body inhalation. Age cut off point was 12 years. Chest X-ray and Complete blood count were performed in every patient. In all these patients, the foreign body was removed under general anesthesia with controlled ventilation and with surface oxymetry. Karl Storz rigid bronchoscope was used for removal of these foreign bodies. The size of the bronchoscope was selected according to the age of the patient. Bronchoscopy was performed by a paediatric surgeon. Antibiotics, oxygen and steam inhalation were administered according to the individual needs, both before and after removal of foreign body. On two patients, open surgical procedure (thoracotomy) was required because of failure of bronchoscopic removal and due to established complication of bronchiectasis and empyema.

RESULTS

Out of the 108 patients in this study, 63% (n=68) were male and 37% (n=40) were female. Ages ranged between 5 months to 12 years with a mean of 3.97 years. Majority of the patients were under three years of age. Majority of the children were brought by the parents with complaints of inhalation of some form of foreign body. Dyspnoea and tachypnoea was present in 81% (n=88), coughing in 68% (n=74),cyanosis in 47% (n=51), fever in 43% (n=46) and choking was noted in 37%(n=40). 77% (n=83) had diminished air entry. There was wheezing in 25% (n=27), crepitations in 25% (n=27), rhonchi in 14% (n=15) and there was stridor in 8% (n=9). 32% (n=35) patients had normal Chest X-ray findings perhaps due to the fact that most of the foreign bodies were radiolucent. 60% (n=65) of these patients had hyperinflation on the side of entrapment of foreign body. Only 0.9% (n=1) patient had emphysematous changes. 0.9% (n=1) had bronchiectatic changes and 0.9% (n=1) had pleural effusion. 2.7% (n=3) patients were with atelectasis. Lobar collapse was found in 5.5% (n=6) patients with tracheal shift. 4.7% (n=5) of the patients had mediastinal shift to the opposite side of the foreign body. 12% (n=13) of the patients had radio-opaque foreign bodies. During bronchoscopy, 61% (n=66) patients had the foreign body in the right main bronchus, 10% (n=11) patients had the foreign body in left main bronchus, and 5.5% (n=6) patients in the trachea. 1.9% (n=2) had coughed up and swallowed the foreign bodies. On fluoroscopy these foreign bodies were found in the gastrointestinal tract. 36% (n=39) of the foreign bodies aspirated were non-organic in nature and 42.6% (n=46) foreign bodies were organic in nature. The most common objects 26% (n=28) were pieces of peanuts, 10% (n=11) were beetle nuts, pulses were found in 2.7% (n=3) and in 2.7% (n=3) pieces of sugar cane, thorn and peanut shell were found. In 0.9% (n=1) patient, complete small fish had to be removed in bits and pieces from the trachea. *Most common non-organic foreign bodies in our series 24% (n=26) was a whistle,* which contains three parts, one metallic and two rubber pieces and most of the time it is inhaled as a whole while taking deep inspiration through it. Metallic ring, pallets, nail safety pins, small watch batteries, ring stones and rubber piece of fountain pen were other foreign bodies and

constituted 12.2% (n=13) of the total foreign bodies (Figure 1). Pus was present in 19% (n=21) cases. 1.9% (n=2) patients were brought very late with bronchiectatic changes and both had to be treated by open surgery due to failure of bronchoscopic removal. 10% (n=11) patients showed sign of slight endobronchial bleeding, and 0.9% (n=1) patients had surgical emphysema followed by removal of fish through trachea, which resolved by conservative management. Repeat bronchoscopy had to be done in 6% (n=7) patients. The time interval between aspiration of foreign bodies and their removal ranged from one hour to five months. Majority of these cases 65% (n=70) were seen within 24 hours. There was no mortality during bronchoscopy, 58% (n=63) patients were allowed home within 24 hours.

Figure 1: Tracheobroncial foreign bodies



DISCUSSION

Our review of the foreign bodies in airways confirms the findings of other studies that the majority of the children presenting with foreign bodies are under three years of age[6,7]. In our series 55% (n=59) patients were under three years. The peak incidence in early childhood is related to the fact that these children are in the habit of putting objects in their mouth[8,10] as well as *toys like whistles are also common attraction. These are easily available in every corner shop within the cheap sweet packets. This whistle is of poor quality with a balloon attached at its distal end, which has proved to be a serious hazard, because as the balloon gets deflated it pushes the content of the whistle back into the air passages of the child. We are making efforts to have it removed from the market through various means and recently there has been objective success in reducing the frequency of accident from this whistle.* In our region the peanuts and beetle nuts are other offending foreign bodies but unfortunately no real success has been achieved in making these inaccessible to small children. Earlier this century, the mortality rate from foreign body aspiration prior to the development of bronchoscopic retrieval techniques and controlled anesthesia, was very high. Currently the mortality rate associated with foreign body aspiration is minimal. It is important to educate parents on the potential risks involved in foreign body inhalation and advise them to keep small objects out of the reach of children. The male to female ratio in our study 1.7:1 is not significantly different from previously reported cases (2:1 and 1.8:1)[6,9]. Radiographic findings were often not very helpful especially in radiolucent foreign bodies, which accounted for 32% (n=35). For this reason, bronchoscopy is indicated when the clinical history is strongly suggestive of foreign body inhalation[5]. Pneumatic changes were seen in those cases where the diagnosis was delayed. 42.6% (n=46) foreign bodies found in our analysis were organic in nature, Peanut being the most common. In this respect our study is similar to the reports form the West, where peanuts were the most commonly encountered foreign bodies[8,9]. But non-organic objects are different in our series; *whistle being the most common object inhaled. This appears to be related to non-existent manufacturing laws with regard to quality control and safety of production of various good quality and safe toys to which children are commonly exposed.*

In our health service, there is a real need for availability of proper endoscopic instruments and controlled anesthetic facilities in most hospitals, which at present is only available in very few tertiary care centres and the patients have to travel long distances to utilize these facilities. This measures has potential to save

many lives of otherwise healthy children[10].

It is also important to follow these patients over a long period to evaluate the changes that might occur in the lungs and respiratory functions[11]. This is especially important in patients where the foreign bodies have been present for a long period and where removal of foreign bodies has been difficult. It is recommended that if a child has been having respiratory symptoms like cough and wheezing despite the adequate medical treatment or on X-rays show unilateral lung changes like consolidation and fibrosis, a foreign body should be suspected and bronchoscopy should be performed, despite the fact that no history of foreign body inhalation may be forthcoming.

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