Foreign Body Aspiration in Children: Current Trends in the North of Jordan

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Abstract

Objective: Foreign body aspiration is a common and serious problem among children accounting for 7% of the lethal accidents in children aged 1to 3 years. The aims of this study were to examine the current trends in paediatric foreign body aspiration at the North of Jordan and to develop safety guidelines that aid in prevention of this hazard.

Methods: Records of children who underwent bronchoscopic examination for foreign body aspiration between March 2002 and April 2005 were reviewed retrospectively. Age, sex, history of foreign body aspiration, symptoms, radiological examination and bronchoscopic findings were recorded and analyzed.

Results: A total of 127 patients underwent rigid bronchoscopic evaluation with a median age of 24 months. FBA was confirmed in 102 patients (80%). Of these, 22 (21.5%) were less than one year of age, 70 (68%) were less than two years of age and 78 (76%) were less than three years old. Nuts such as sunflower seeds, water melon seeds and peanuts were found in 45% of children less than one year of age, in 61% of children less than two years and in 65% of children less than three years of age. Inorganic material such as pins, plastic and metal toys' pieces were present in 71% of children above the age of three years.

Conclusion: Our infants and toddlers in North of Jordan have been aspirating nuts at a high rate. A public awareness campaign is warranted. Parents must be awared that children under the age of three years should not be fed nuts.

Keywords: Foreign Body, aspiration, Children, North of Jordan.

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Introduction

Foreign Body Aspiration (FBA) is a common and serious problem among children, accounting for 7% of the lethal accidents affecting children aged 1 to 3 years. [1-3]

It may result in a wide range of clinical problems in susceptible children. Foreign Bodies (FB) that pass through the larynx usually end up in one of the bronchi and seldom cause life-threatening hypoxia. However, an object may be too large to enter a bronchus and a life-threatening tracheal obstruction may occur.

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Morbidity and mortality increase in the younger age group, presumably because children of a young age have narrow airways and immature protective mechanisms. In one series, 90.9% of deaths were in children between 1 and 3 years, [4] while another study reported that 78% of those who died after FBA were between 2 months and 4 years of age. [2]

The spectrum of airway FB varies from country to country, depending on the diet and custom of the population. Vegetable matter and dry fruits have been reported to be the most commonly aspirated food in the pediatric airway. [5-7] In most of the developed Western societies, peanuts are the most commonly aspirated FB. [8]

The aims of this study were to examine the current trends in paediatric FBA at the North of Jordan and to develop safety guidelines that can achieve a significant reduction in FBA-related mortality and morbidity in children.

Materials and Methods

Records of children who underwent bronchoscopic examination for FBA between Dec 2003 and Jan 2006 were reviewed retrospectively. Age, sex, history of FBA, symptoms and signs, radiological examination and bronchoscopic findings were recorded and analyzed. All bronchoscopic examinations were done under general anaesthesia using rigid bronchoscopes at King Abdullah University hospital. This hospital is a tertiary referral hospital for a population of nearly one million people.

Results

A total of 127 patients with suspected FBA underwent bronchoscopic evaluation. Presence of FB in the airways was confirmed in 102 patients (80%) with a median age of 24 months (range between 8 months and 12 years). Seventy children were boys, and 32 were girls (2:1).
Of the 102 patients, 70 (68%) were under 2 years of age, 22 (21.5%) were under one year and 20 (20%) were 3-8 years.

The least common age group was 9-12 years accounting for 4% of children (4 patients) followed by 2-3 years group with 8 patients who had FB (8%) (Table 1).

In this series, a choking episode was witnessed in 81 patients (79%). while 21 children (21%) presented without a definite history of choking. Coughing was the most common presenting symptom (70%) followed by wheezing (67%), fever (15%) and recurrent pneumonia (10%).

The most common signs of tracheobronchial FBA were the decreased air entry (38%), followed by localized wheezes (21%). Normal physical examination findings were noted in 10% of patients.

Sixty three patients in our study (62%) reached the hospital within 48 hours of the choking episode and 93 patients (91%) reached the hospital within one week. (Table 2).

Table (1): Age incidence.

Age group (years)	*No. of cases (%)*
<1	**22 (21.5%)**
1-2	**48 (47%)**
2-3	**8 (8%)**
3-8	**20 (19.5%)**
9-12	**4 (4%)**

Table (2): Time lapsed between aspirations and reaching the hospital.

Duration (days)	*No. of cases (%)*
<1	*33 (32%)*
1-2	*30 (29.5%)*
3-7	*30 (29.5%)*
8-15	*4 (4%)*
16-30	*3 (3%)*
>30	*2 (2%)*

Emphysema of one lung or lobe due to air-trapping was the most common radiographic finding in the study group (39%), followed by atelectasis and radio-opaque FB (34% and 5% respectively). Chest X-ray was normal in 22 patients (22%) (Table 3).

Table (3): Radiological findings.

Radiological findings	No. of cases (%)
Obstructive emphysema	40 (39%)
Collapse	31 (30%)
Radio-opaque object	9 (9%)
Normal X-ray	22 (21.5%)

Dried nuts such as peanuts, sunflower seeds and water melon seeds were found in 45% of children less than one year of age (22 patients), while solid vegetable foods such as raw carrots and apple were found in 50% of cases (11 patients). In one child a plastic FB was retrieved. (Peanuts 8, seeds 2, carrots 6, apple 2, food debris 3, plastic 1) (Table 4).

Table (4): Type of Foreign body.

Age (years)	Nuts	Food particles	Plastic particles / toys	Pins
<1 (n=22)	10 (45%)	11 (50%)	1 (1%)	-
1-2 (n=48)	33 (69%)	15 (31%)	--	-
2-3 (n=8)	8 (100%)	-	-	-
>3 (n=24)	7 (29%)	-	8 (33%)	9 (38%)

Of 48 Children in the age group 1-2 years, dried nuts were found in 33 (69%), while solid foods such as potato, meat, carrots, rice were found in 15 cases (31%).

In the age group 2-3 years, 8 children had aspirated with peanuts.

FB were found in 24 Children above the age of 3 years. Nuts were found in 7 patients (29%), while plastic toys particles and pins were retrieved from airways in 9 (38%) and 8 children (33%), respectively.

Nuts such as sunflower seeds, water melon seeds and peanuts were found in 45% of children less than one year of age, in 61% of children less than two years and in 65% of children less than three years of age. Inorganic material such as pins, plastic and metal toys' pieces were present in 71% of children above the age of three years.

Discussion

FBA is a significant health hazard in children that is associated with high risk of mortality and morbidity. Bronchoscopic examination is diagnostic once we have acute respiratory symptoms. A suggestive history of FBA followed by cough usually prompts bronchoscopic evaluation and endoscopic removal as the main treatment option. In keeping with other reports,[9,10] 80% of our patients with suggestive history who underwent bronchoscopy were found to have FB in their airways. Of those without a suspicious history, FBA should remain high on the differential diagnosis list since many children may undergo prolonged erroneous treatment secondary to misdiagnosis. Friedman reported that 20% of children in their series were treated with a different diagnosis other than FBA for over a month before undergoing removal of FB by bronchoscopy. [11]

Radiological examination can be helpful in the diagnosis of FBA. In situations of aspirated radiopaque objects, chest x-rays can provide direct evidence of FBA as seen in five of our patients. Radiolucent objects may still provide radiological clues such as unilateral lung emphysema or air trapping in partial obstruction; atelectasis or pneumonia in total obstruction of the bronchus. These indirect radiological features were seen in 73% of children in the current series. On the other hand, 22% had a normal radiograph despite having FB body in their airways. Other studies reported normal chest X-ray in 18% to 60% of the patients with FBA. [1, 2, 12-17]

FBA were most frequently observed in boys with a male-to-female ratio of 2:1, which was similar to previous studies. [5, 18, 19] This finding probably reflects the more impulsive nature of boys and their more adventurous games.

FB were present in 21% of children less than the age of one year. This is similar to previous reports by Narasimhan et al., [20] where they reported an incidence of 20%, and those by Morley et al., [21] where they found that 53% of patients were less than 18 months of age. Other series found lesser incidence of FBA in infants younger than one year of age with a range between 8% and 12%.[10, 22-24] Solid foods such as carrots, apple and other food debris were found in 50% of infants in this age group in the present review. These findings reflect a trend toward early introduction of solid food during weaning period. Mothers were enthusiastic about a young infant sharing the same type of food with older siblings and other family members as early as possible. This may have to do with increasing economic pressure and insufficiency of maternal education especially of younger mothers in this geographical area.

At the same age group, nuts such as peanuts and seeds were found in 45% of cases. The commonest story was that of an older sibling feeds a younger sibling. Lack of adequate maternal supervision of both infants and toddlers is to be blamed here.

Children, especially those aged 1-3 years, have a tendency to put everything in their mouths. In addition, they chew their food incompletely with incisors before their molars erupt. Objects or fragments may be propelled posteriorly, triggering a reflex inhalation.

Lack of safe eating practices is another important to the problem factor contributing to the problem in this age group. Playing, laughing or crying and quarreling with siblings while the mouth is full of food particles often lead to FBA once forced inspiratory movement occurs.

Most FBA occur while eating or playing with small objects, however, this is not the only mechanism. It is not unusual in our society for a child to aspirate while his parents feed him with particulate matters such as nuts.

A strong awareness campaign is an essential step if significant reduction in the incidence of FBA with its subsequent morbidity and mortality is to be achieved. The seriousness of FBA and the fact that it may lead to several pulmonary complications as well as death must be clearly communicated to all parents.

More attention needs to be focused on young mothers; teaching them the proper ways of weaning and the suitability of different types of foods and appropriate food size and texture to each stage during the development of the infant. Toddlers must be taught safe eating practices by parents. They should be advised against any physical or emotional activity during eating. Parents need to make sure that these practices are observed. In addition, strict supervision is important to discourage toddlers from feeding young siblings.

Parents must be made aware that nuts are not suitable for children less than the age of 5 years; therefore, they must be kept inaccessible to them. At the same time, parents should abstain from the habit of feeding nuts to children.

When it comes to choosing toys, appropriate toys that match the child's age must be chosen. Children need to understand the dangers of putting toys in their mouth. They also need to be taught to clean up after finishing playing with toys especially the small parts that can attract the attention of younger siblings. Sharing part of the responsibility with the adults will reinforce the process of education. Exercise of adequate parental supervision at all times is necessary if reduction in morbidity and mortality from FBA is to be achieved.

Further studies will be required after launching the awareness campaign in order to establish its impact in reducing the mortality and morbidity of FBA. Furthermore, continuous parental education should be emphasized and be an essential part of public health initiatives in the community.

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استنشاق الأجسام الغريبة لدى الأطفال: دراسة أجريت في شمال الأردن

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الملخص

لو نظرنا الى المشكلات الشائعة التي تحدث للأطفال لوجدنا " إستنشاق الأجسام الغريبة" إحدى هذه المشكلات وأكثرها شيوعاً عندهم، حيث انها تشكل ما نسبته (7%) من أسباب الوفاة العرضية لديهم من عمر (3 الى 11 سنة).

كان الهدف من هذه الدراسة هو الوقوف على حجم هذه المشكلة في شمال الأردن ومعرفة اسبابها وكيفية الوقاية منها وتجنب المخاطر الناتجة عنها في المستقبل.

تم دراسة (12 سجلاً) للأطفال الذين تم عمل منظار رئوي لهم نتيجة استنشاقهم أجساماً غريبة في الفترة الواقعة ما بين اذار 2002 ونيسان 2005، كان معدل اعمار هؤلاء الأطفال سنتين.

تأكد لنا استنشاق الأجسام الغريبة في 102 طفل (80%)/ 22 طفلاً (21.5%) من هؤلاء كانوا أقل من سنة، 70 طفلاً (68%) أقل من سنتين و 78 طفلاً (76%) أقل من ثلاث سنوات.

المكسرات وبذور البطيخ وجدت في 45%، 61% من الأطفال أقل من سنة وسنتين وثلاث سنوات حسب السن وحسب الترتيب، مواد غير عضوية مثل الدبابيس وألعاب الأطفال الصغيرة وجدت في 71% من الأطفال فوق عمر الثلاث سنوات.

الخلاصة: في محاولة لتلخيص ما تم ذكره آنفاً، يمكننا القول أن الأطفال الصغار والرضع منهم قاموا باستنشاق المكسرات بنسبة عالية، وبناءً عليه فإنه يجب عدم إعطاء الأطفال في مثل هذه السن أو ممن هم دون الثالثة أي نوع من المكسرات أو بذور البطيخ، إضافة الى إبعاد المواد غير العضوية عن متناول ايديهم حفاظاً على سلامتهم.

ما زال الأمر يحتاج الى توعية وإرشاد ونصح كبير جداً، فالحذر مطلوب في مثل هذه الأمور على كافة المستويات والأصعدة، وما هي الا محاولة متواضعة للمساهمة في زيادة ونشر الوعي لدى الآباء والامهات لتكثيف جرعات الرعاية والاهتمام بأطفالهم تجنباً لأي مشاكل قد تنتج مستقبلاً جراء هذا الإهمال.

الكلمات الدالة: استنشاق، أجسام غريبة، أطفال، شمال الأردن.