

## **Foreign Body Asphyxiation in Children**

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*We aimed to investigate the frequency and epidemiological features of deaths due to foreign body asphyxiation (FBA) in childhood, over 1990-2003. Of the victims, 14 (63.6%) were male and 8 (36.4%) females. The mean age of the victims was  $2.2 \pm 0.6$  years. There were 20 (90.9%) children between 1 and 3 years, and two other cases at 2/12 and 5 years of ages. All aspirations had occurred at home. Eight (36.4%) of the victims were dead on arrival, 11 (50%) on intervention, and 3 (13.6%) after complications. Food material was the most commonly aspirated foreign body in 81.8% of the cases, nuts being the most common (50%). Food asphyxiation remains a common problem particularly in children between 1 and 3 years of age in our region. These fatal accidents can be prevented by parental education and early recognition and management of the situation.*

**Keywords:** *Aspiration, Asphyxiation, Child, Death, Foreign body.*

**F**OREIGN body asphyxiation (FBA) is a very serious accident in childhood comprising an important proportion of accidental deaths(1-3). Besides aspiration of food material, deaths also occur from common household and non-food objects such as metals and plastics, rocks, toys or parts of toys(2,3, 4-7). Death most often results from asphyxia due to compromise of major airways(7).

This emergency condition occurs most frequently in children under 4 years, with a higher incidence in boys(5,6,8-10). In the USA about 500 children die each year due to FBA(3). This higher occurrence in children has also been confirmed in various series without a declining incidence, despite significant advances in emergency airway management and endoscopic technology(6). This is likely to

happen as long as children continue to explore their surrounding using their mouths(6).

In Turkey, deaths from aspiration of foreign material are not listed as a separate category. To determine the frequency and epidemiological features of such deaths in our region, we reviewed the autopsies performed at the Diyarbakir Branch of the Council of Forensic Medicine.

### **Subjects and Methods**

We retrospectively reviewed the records of forensic cases due to FBA examined at the Diyarbakir Branch of the Council of Forensic Medicine during the the period 1990-2003. Over this period this office investigated approximately 8330 medicolegal deaths, 22 of which were deaths in children under 15 years of

### Key Messages

- Food asphyxiation remains a common problem particularly in children between 1 and 3 years of age.
- Parents should be instructed to abstain from feeding dry fruits, nuts and seeds to young children and to teach their children to avoid any physical or emotional activity while eating.

age due to FBA. Case file information from autopsy and hospital reports were considered.

Information reviewed for each case included the age, sex of child, result of postmortem examination, time of death, type of foreign body, and site of foreign body in the respiratory tract.

#### Results

Of the victims, 14 (63.6%) were boys and 8 (36.4%) girls. The mean age at death for victims was  $2.2 \pm 0.6$  years, ranging from 2 months to 5 years. All children except two (90.9%) were between 1 and 3 years of age. Other two victims were a 5-year-old boy and a 2 month-old-baby asphyxiated by the obstruction of epiglottis with a peel of grapes. Food was the aspirated object in 81.8% of the cases. Nuts (50%) were the most commonly aspirated foreign bodies. The other of foreign bodies were beans in 4 (18.3%), pills in 3 (13.7%), olive, sweet, screw and grape in one each.

Carina (54.5%) was the most common site of the foreign body in the respiratory tract. The foreign bodies were seen in the respiratory tract at trachea in 4 (18.2%), larynx in 3 (13.7%), epiglottis in 2 (9.1%), and bilateral main bronchi in 1 (4.5%) victims.

According to the time of death, 8 (36.4%) of the victims were dead on arrival, 11 (50%) on intervention, and 3 (13.6%) after complications due to delayed hypoxia. All aspirations had occurred at home. There was no

seasonal difference in rates of FBA in our cases.

#### Discussion

Foreign body asphyxiation leading to death is common between the ages of 1 and 3 years(3,5-7,9,11). This happens because children younger than 3 years of age have a natural tendency to put foreign objects in their mouths(3) and while playing, crying or laughing the possibility of making a forced inspiring movement increases the risk for a choking injury or death. There was also a predominance of boys in this study (63.6%), probably related to their higher activity as demonstrated in other accident statistics(3,6, 8-10).

There are limited number of studies reporting the location of foreign body in fatal cases. Byard(8) has found the location of the foreign body in larynx in 2 cases, and in carina, trachea, right main bronchus, and both main bronchi in one case each. In the study of Tan, *et al.*(6), there were 2 fatal cases who were both asphyxiated in the carina. In our study, the most common found location of the aspirated foreign body was carina in 54.5% of all cases. The carina might have been the main localization at the time of asphyxiation. However, it is also possible that these foreign bodies were pushed down on attempts to resuscitate or they could have slipped below after the postmortem loss of laryngotracheal tone.

The spectrum of airway foreign bodies 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(1,3,6). In most developed Western societies, the peanut is the most commonly aspirated foreign body as in our study(12). Nevertheless, in Lifschultz's series of deaths due to FBA nonfood objects like latex balloons and other toys were found most frequently(2). Byard has also reported 3 cases with food and 7 with nonfood objects(8). According to a large pediatric series with FBAs in our region, watermelon seeds constituted the most commonly found aspirated material(5), but in our series no fatal cases with watermelon seed aspiration was found.

Education aimed at increasing diagnostic acumen of the physicians and at public awareness are the most important steps needed to reduce the morbidity and mortality due to FBA. Dissemination of information to parents and childcare and child health professionals on potentially dangerous foods and the need for safe eating practices may be recommended by using telecommunication facilities and serial educational programs.

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