ORIGINAL ARTICLE

Foreign bodies in the upper airways: the experience of two Italian hospitals

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Key words

Upper airway • Foreign body • Italy

Summary

Objective. *To study the pattern of foreign bodies in the upper airways as emerging from the hospital records in the Bologna and Siena hospitals in Italy 1997-2002.*
Methods. *A retrospective review of hospital records was performed using a standardized protocol. All injuries with ICD9 (International Classification of Diseases, 9th revision) codes ranging from 931 to 934 which occurred in children age 0-14 were considered for the database.*
Results. *One hundred ninety seven patients were included in the database with a diagnosis of Foreign Bodies (FB) over the study period, 78 with ICD931, 105 with ICD932, 12 with ICD933 and 2 with ICD934 discharge diagnosis. Of the 197 patients, 51.90% of the patients were males and the 48.10% were female. Median age was 4 (2, 6).*
At the moment of the injury, the child was eating (11%), playing (83%) or studying (4%) or cleaning ears (2%). The child was supervised by an adult in doing his/her activities at the moment of injury in the 84.2% of the cases.
The child reached the hospital using always private transport (100%), never by using an emergency transport (0%). Most commonly, FB were extracted in ambulatory (95.4%), more rarely using an endoscopic procedure (4.1%), and never using surgery. Hospitalization was required in the 0.5% of cases (1).
Conclusions. *Our study showed the substantial epidemiological similarity of the Italian data with the experience of other center in the world. The burden of chocking was very limited in our country, as proven by the limited access to emergency and more invasive procedures. Nevertheless, some consideration can be made from the preventive point of view. Quite surprisingly, the majority of injuries occurred under the supervision of an adult in playing or recreational activities.*

Introduction

Upper airways foreign bodies (FB) are a common and well documented emergency in children [1]. The ingested foreign material occurs exclusively in the esophagus and it usually passes without further trauma trough the rest of the gastrointestinal tract, but in case of abnormalities [2]. The most common FB in the upper airways tract are coins, nuts, both fish and chicken bones and toys [3, 4]. The tract of the cricopharyngeal muscle is the site where the esophageal FB usually sticks [5]. Data are widely available in the literature for a number of countries [5, 6], most commonly using hospital based statistics more than systematic and nation-wide registries [6]. Quite surprisingly, beside some specific studies on the clinical impact and treatment of FB injuries [7], no epidemiologic data on the pattern of FB are presented in the literature regarding Italy. To fill this gap and to compare the Italian experience with the published literature, we conducted a retrospective survey in two Italian hospitals in the years 1997-2002.

Materials and methods

Records of all patients aged 0-14 years, admitted from 1/1/1997 to 31/12/2002 in the "Ospedale Sant'Orsola" of Bologna and "Policlinico Le Scotte" of Siena were revised according to the ICD9-CM discharge diagnosis [8]. All patients with a discharge diagnosis of ICD931 (FB in ears), ICD932 (FB in nose) ICD933 (FB in pharynx and larynx) and ICD934 (FB in trachea, bronchi and lungs) were included in the study and their corresponding clinical records revised using a standardized Case Report Form. Information about demographic characteristics of the child, type and site of the FB, technique for removal, circumstances of the event and complications were collected.
Data were processed for quality assurance and double entered in a MS Access database.
Data were described using percentage (absolute number in parenthesis) or median (interquartile difference) where appropriate. Confidence intervals were presented at the 0.95 level for inferential purposes. Statistical analysis was conducted using the SPSS ver 7.0 software.

Tab. I. Age distribution of children according to gender.

Age	Gender			
	Female		Male	
0	1	33.3%	2	66.7%
1-3	28	53.8%	24	46.2%
4-14	61	45.9%	72	54.1%

Tab. II. Distribution of complications according to age, gender, type of foreign body and technique used for removal.

	Complications		Total	
	Yes	No		
Age				
≤ 3 years	53	3	56	28.7%
> 3 years	130	9	139	71.3%
Gender				
Male	84	7	91	48.4%
Female	93	4	97	51.6%
Foreign body type				
Inorganic	90	1	91	53.8%
Organic	71	7	78	46.2%
Extraction				
Endoscopy	5	3	8	4.0%
Other	181	9	190	96.0%

Results

One hundred ninety seven patients were included in the database with a diagnosis of FB over the study period, 78 with ICD931, 105 with ICD932, 12 with ICD933 and 2 with ICD934 discharge diagnosis. Of the 197 patients, 41.90% of the patients were males and the 48.10% were female. Median age was 4 (2, 6 quartiles), and the complete age distribution is given in Table I. Details of the types of FB are shown in Table III. The FB was associated to other objects in 16 cases (8.12%). In this case, the associated object was a toy (9, 56.25%) or food (7, 43.75%).

At the moment of the injury, the child was eating (11%), playing (83%) or studying (4%) or cleaning ears (2%). The child was supervised by an adult in doing his/her activities at the moment of injury in the 84.2% of the cases.

The child reached the hospital using always private transport (100%), never by using an emergency transport (0%). Most commonly, FB were extracted in ambulatory (95.4%), more rarely using an endoscopic procedure (4.1%), and never using surgery. Hospitalization was required in the 0.5% of cases (1).

Discussion

In this study, children under the age of 3 constituted 28.7% of all cases. This percentages is lower with regard to the previous reports in the European experience [9]. While the gender distribution is similar to published data [10].

Type of FB have a similar distribution in terms of organic and inorganic structure, as in other north-American databases [11], but differ quite largely from Asian, African [12] and Australian data [13]. Hospitalization is required very rarely, usually not involving any emergency transport. This reflects on the extremely low incidence of fatalities, and the general good clinical approach, using whenever possible endoscope and less frequently surgical procedures.

Nevertheless, some consideration can be made from the preventive point of view. Quite surprisingly, the majority of injuries occurred under the supervision of an adult in playing or recreational activities. This finding is in agreement with some recent reviews highlighting the insufficient supervision of adults in preventing injuries [6].

Association between organic and inorganic objects was observed in a limited number of cases, evenly distributed in the two sense (food associated with inorganic objects and inorganic objects associated with organic ones), indicating a no increase of risk between the two types of association. Although with the limitation of a retrospective study with the evidence among child behaviors being self-reported by parents, the need of further research of behavioral aspects conducing to FB injuries, as clearly emerging from the most recent literature [14, 15], is confirmed by this bi-centric Italian experience.

Tab. III. General distribution of upper airways FB by type and stratified according to age of the child.

Foreign body type		Age ≤ 3 years		Age > 3 years		Total	
Organic objects							
	Food						
	Bones	2	3.6%	8	5.7%	10	5.1%
	Seeds, nuts, berries and grains	14	25.0%	32	22.9%	46	23.5%
	Sweet	1	1.8%	3	2.1%	4	2.0%
	Other food	3	5.4%	3	2.1%	6	3.1%
	Other organic	2	3.6%	6	4.3%	8	4.1%
Inorganic objects							
	Stationery						
	Leads	1	1.8%	11	7.9%	12	6.1%
	Pen caps	4	7.1%	16	11.4%	20	10.2%
	Other stationery	1	1.8%	3	2.1%	4	2.0%
	Toys						
	Balls			4	2.9%	4	2.0%
	Pearls	2	3.6%	7	5.0%	9	4.6%
	Piece of soft toy			1	0.7%	1	0.5%
	Plastic toys	4	7.1%	6	4.3%	10	5.1%
	Other toys			2	1.4%	2	1.0%
	Other inorganic						
	Button	4	7.1%	5	3.6%	9	4.6%
	Pebble	4	7.1%	5	3.6%	9	4.6%
	Plastic			3	2.1%	3	1.5%
	Sheets, foils, film and cotton	9	16.1%	11	7.9%	20	10.2%
	Ear plugs			2	1.4%	2	1.0%
	Caps			1	0.7%	1	0.5%
	Polystyrene balls	2	3.6%	2	1.4%	4	2.0%
	Other	3	5.4%	6	4.3%	9	4.6%

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