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Foreign bodies of ear, nose and throat in paediatric age groups: A retrospective study

Abhishek Srivastava[1,*] and Disha Koul[2]

[1]Department of ENT, Laxmi Chandravansi Medical College, Laxmi Chandravanshi Medical College and Hospital, Bisrampur, Palamu-822132, Jharkhand, India
[2]Department of Otorhinolaryngology, Swastik ENT Centre and Hospital, Nr Kathalmore, Ranchi, Jharkhand 834005, India

Abstract

Introduction: Patients in paediatric age group in a routine otorhinolaryngology outpatient department present with varied complaints of foreign body insertion. They can be sometimes simple to remove but at many instances produce tricky surgical challenges to safely remove the foreign body. The evaluation of the psychosocial behaviour of patients presenting with foreign bodies in the ear, nose, and throat aims to develop a protocol based on a scoring system for their removal.

Methods: Emergency department data from September 2021 to August 2024 was analysed retrospectively. A group of 217 patients below 15years of age who presented with foreign bodies of ear, nose and throat were included for study. Their biological data, psychosocial state, type and location of foreign body, presentation, associated complication and methodology for removal and postoperative management were obtained.

Results: The patients in early childhood (1-5 yrs) had maximum number of foreign bodies (131, 60.36%). The foreign bodies were mostly located in ears (57.14%), nose (19.35%), oropharynx (13.82%), oesophagus (8.75%) and bronchus (0.92%) sequentially according to numbers.

Conclusion: This study highlights the prevalence and distribution of foreign bodies in paediatric patients with their psychological state, particularly in early childhood. It also proposes a novel scoring system to aid in the effective planning and management of foreign body retrieval in emergency settings.

Keywords: foreign bodies; ear; nose; oesophagus; bronchus

Introduction

The patients presenting with foreign bodies are routinely seen in Outpatient Departments (OPDs) and emergency department of tertiary care hospitals. However, incidence of foreign body insertion is most common in children especially in less than 10 years of age [1]. Increased prevalence of the FB in children is attributable to the inquisitive nature of the children and their nature to explore the environment [2]. They are often seen by otolaryngologists and paediatricians or primary care clinicians.

Foreign bodies may widely vary in shape, size, composition and colour. The symptoms can also range from being absolutely asymptomatic to acute life-threatening condition. Most ear and nose foreign bodies can be removed on outpatient basis with minimal risk involved. The common methods that are used for foreign body removal are use of forceps, foreign body hooks, aural syringing and suction method. However, the various classifications of foreign bodies available do not explain the severity of clinical impacts on patients.

***Corresponding author:** Dr. Abhishek Srivastava, Assistant Professor, Department of ENT, Laxmi Chandravansi Medical College, Laxmi Chandravanshi Medical College and Hospital, Bisrampur, Palamu-822132, Jharkhand, India. Email: swastikenthospital@gmail.com

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Moreover, an assessment of mental health of these patients was warranted [3]. The foreign bodies can be classified as living(animate) and non-living(inanimate). The non-living ones are further divided into organic and inorganic and hygroscopic(hydrophilic) and non-hygroscopic (hydrophobic). Airway foreign bodies are a medical emergency and require surgical consultation as they are life threatening [4].

Majority of the pharyngeal foreign bodies (FBs) are visible during direct examination of the throat. Hence, these FBs can be easily removed, whereas the invisible FBs need rigid or flexible scopes for removal [5]. FBs can lead to serious outcomes, like infections, deformities, bleeding, breathing difficulties etc. Hence, primary goal is safe, timely and complete FB removal, necessitating clinicians to select appropriate methods of retrieval and to identify cases requiring specialist referral [6].

Foreign bodies in otorhinolaryngology cases are observed especially in children under five years of age. The reasons for this have been claimed to be curiosity of discovering orifices, boredom, games, intellectual disability, mental retardation, hyperactivity or attention deficit disorders and a lack of careful caregivers [7].

The aim of this study was to find out the mental state of patients of paediatric age with foreign bodies and also to develop a simple scoring system for young residents to plan the removal of foreign bodies from ear, nose and throat.

Method

The data was obtained from the emergency department registers of our department from September 2021 to August 2024 after getting approval from institutional ethics committee. The patients presenting with foreign bodies in ear, nose and throat in the age group of up to 15 years were considered and assessment done. The patients were analysed in three groups (1-5yrs, 5- 10yrs and 10 - 15yrs) (Table 1). A total of 217 patients from less than 15 years of age who presented with foreign bodies of ear, nose and throat were included for study.

Table 1: Distribution of patients according to age and location of foreign bodies.

Age	*No.*	*Male*	*Female*	*Right ear*	*Left ear*	*Right nose*	*Left nose*	*Esophagus*	*Oropharynx*	*Bronchus*	*Misc*
1-5Y	131 (138)*	74 (76) *	57 (62) *	44	37	19	17	11	8	2	
5-10Y	64	42	22	19	16	10	9	5	4	0	1
10-15Y	22	14	8	11	9	0	0	0	2	0	
TOTAL	217 (224)*	122	85	74	62	29	26	16	14	2	

Abbreviations: *: Adjusted value in case of foreign bodies on both sides

The information regarding the age group of patients, details of family, mental state of patients and guardians, location of foreign bodies, duration of foreign bodies, plan for removal of foreign body removal and status at the time of discharge was processed.

Results

A total of 217 patients were screened from the records of emergency department presenting with foreign bodies mostly inserted through the opening of lumen of ear, nose and throat. However, there was one male patient aged six years presented with penetrating bamboo stick along the right lateral aspect of neck (Figure 1). The foreign body was penetrating through the skin up to the foramen transversarium of 3rd cervical vertebrae lying in proximity to vertebral artery.

A total of 131(68.36%) patients out of 217 were from the age group of 1-5yrs. There was a slight male preponderance in this age group (56.48% male, 43.51% female).In 1–5-year, age group, 14 patients (10 females and 4 males), there was insertion of foreign bodies in both ears and 2 cases (both males) had foreign bodies in both noses (Figure 2). However, ingestion of foreign bodies in aerodigestive tracts were purely accidental. Migration of foreign bodies to unusual location was seen in 2 of our cases. A 2-yr child swallowed a bell, but it could not be located in oral cavity, neck, chest or abdomen. When X ray for lateral view of skull and neck was done, it was found in nasopharynx (Figure 3). In another case, an18-month child inserted a tablet battery in nose which left unnoticed by parents, later it was found impacted in hard palate (Figure 4).

In the age group of 5-10 yrs we had a total of 64 patients which constituted 29.49% of patients. Male and females were 65.6 % and 34.37% respectively. Foreign body ear was the most common in this category (Figure 5). Also, we observed a definite alteration in psychosocial behavior from normalcy and significant male preponderance in this category of patients.

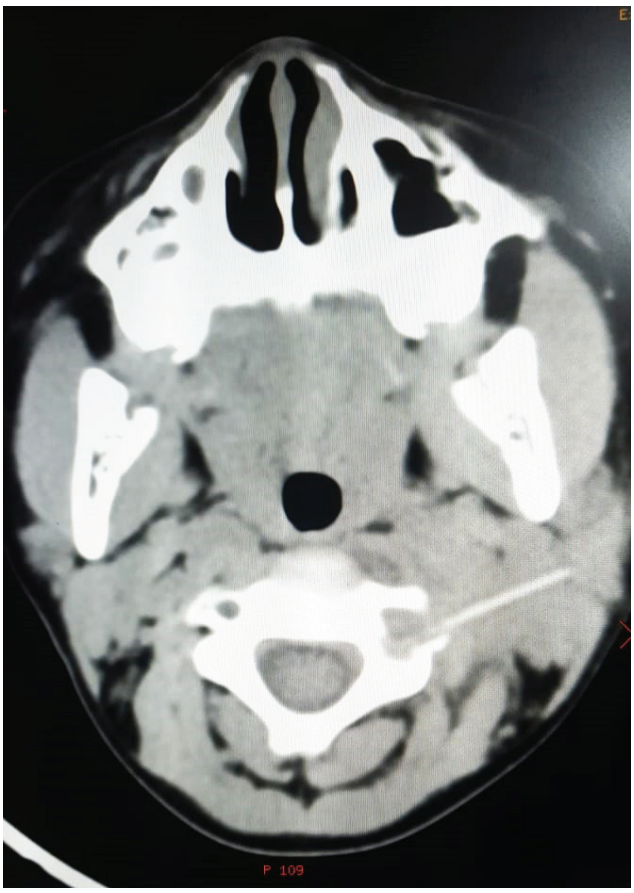

Figure 1: Six years child with bamboo stick in neck.

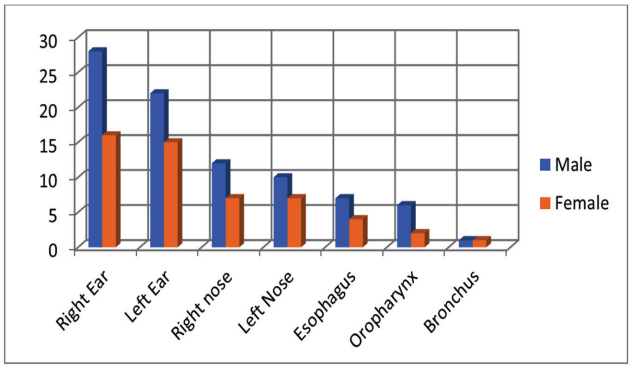

Figure 2: Distribution of foreign bodies in the age group of 1-5 yrs.

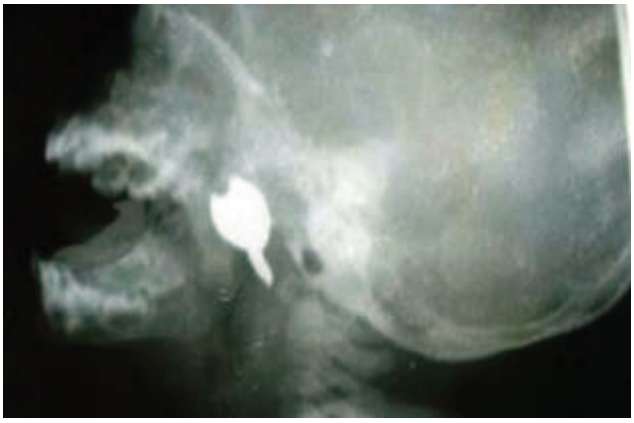

Figure 3: Two-year old child with a bell in nasopharynx.

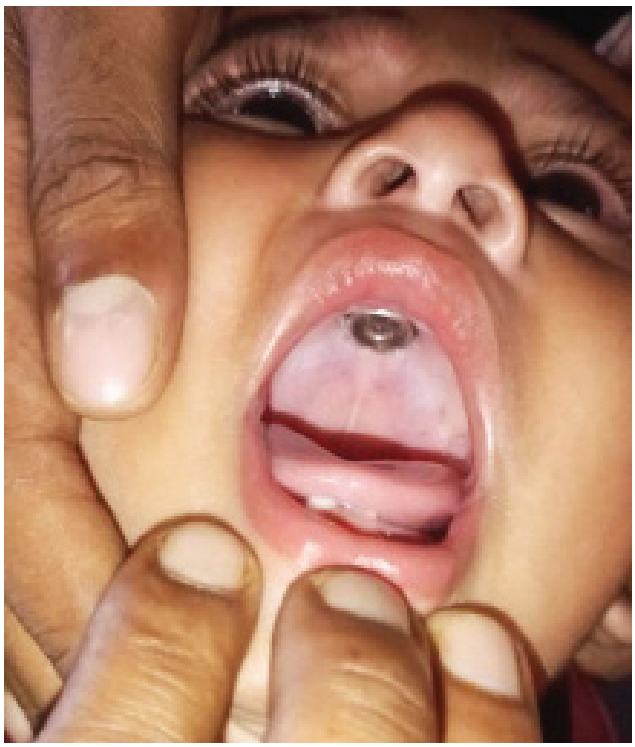

Figure 4: Child with tablet battery impacted on hard palate.

In patients of 10-15 yrs of age most foreign body insertion were in ear (Figure 6), they were accidental in 22 (10.13%) like insect got inside ears while sleeping, cotton ball got stuck in external canal while cleaning as it was loosely wrapped around sticks, bird feathers in ears (in most instances discovered on routine examinations and accidental impaction of fish bones in oropharynx. We did not have any foreign body in nose or aerodigestive tract in this group. However, one of the patients was mentally retarded who inserted the date seed in the right ear. We could not elicit any abnormal psychosexual behavior from such patients or their guardians who brought them to the emergency department.

In case of foreign ear bodies, patients with scores between 5 to 8 were taken for removal of foreign body in clinic. However, patients with scores between 9 to 14 were taken into operation theatre for removal under microscope (Table 2). Patients under 10 years or apprehensive adolescents were taken under general anesthesia.

In case of nose foreign bodies, patients with scores between 5-7 were considered for removal at clinic, however patients with scores in between 8 to 15 were considered for removal in operation theatre under general anesthesia with endoscopic visualization (Table 3). In cases of migrated foreign bodies with injury to anatomical limits often required reconstructive surgeries to restore normal anatomy.

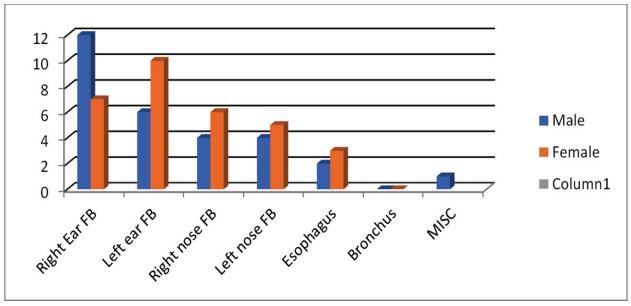

Figure 5: Distribution of foreign bodies in age group of 5-10 yrs.

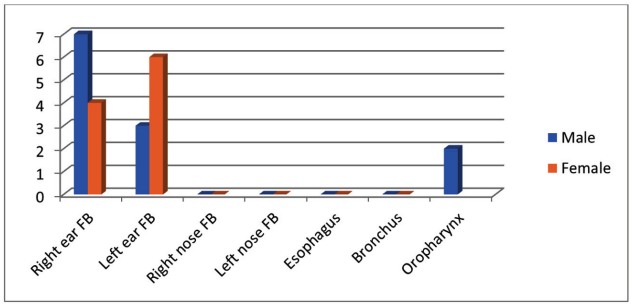

Figure 6: Distribution of foreign bodies in 10-15yrs age group.

Table 2: Scoring system for foreign bodies in ear.

GE	*Location of foreign body*		*History of prior intervention*	*Type of foreign body*	*Mental status*
<5 yrs (3 points)	Cartilaginous: Impacted 2points	Cartilaginous: Non-impacted 1 point	Yes 2 points	Solid occupying >3/4th lumen 3 points	Apprehensive 3 points
5-10 yrs (2 points)	Bony canal: With impaction or granulation 3 points	Bony canal: Without impaction or granulation 2 points	No 1 point	Solid occupying <3/4th lumen 2 points	Non-apprehensive 1 point
10-15 yrs (1 point)	Middle ear 3 points			Compressible 1 point	

Table 3: Scoring system for foreign bodies in nose.

Age	*Location*	*History of prior intervention*	*Duration*	*Mental status*
<5 yrs 3 points	Anterior 1/3rd of inf turbinate 1 point	Without bleeding 1 point	Recent 1 point	Non-apprehensive 1 point
5-10 yrs 2 points	Posterior 1/3rd of inf turbinate 2 points	With bleeding 3 points	Longstanding with crusts or rhinolith 3 points	Apprehensive 3 points
10-15 yrs 1 point	Not visible 3 points			

There were 18 (28.13%) patients who had multiple history of insertion of foreign bodies. In many instances they gave a history that their classmates had inserted foreign bodies which we couldn't confirm.

We also classified foreign bodies based on their potential to inflict injury into innocuous (74.55%) and minacious (25.44%) foreign bodies. The minacious foreign bodies included tablet batteries (Figure 7), pins, pencil leads, wires (Figure 8), match sticks with ignition chemical at the tips, sharp metal (Figure 9) or glass pieces, coin (Figure 10) etc. The others were considered innocuous because their short-term presence is not potentially harmful to the skin, mucosa, or eardrum.

Foreign bodies in aerodigestive tract were removed under general anesthesia using rigid esophagoscopes and bronchoscopes. Most of the patients in all categories had day care admission in IPD from the Emergency department. They were discharged after removal of foreign bodies. However, in cases of foreign body removal under general anesthesia patients were admitted for 24 hours.

Patients presenting with foreign bodies in their ears who required intervention under anesthesia were never intubated. They were administered intravenous sedatives by an anesthetist and a bag with mask ventilation was done. However, in cases of foreign bodies of nose (when required), throat, esophagus and bronchus were administered general anesthesia.

There was always a dilemma to consider patient for clinic-based intervention or operation theatre-based

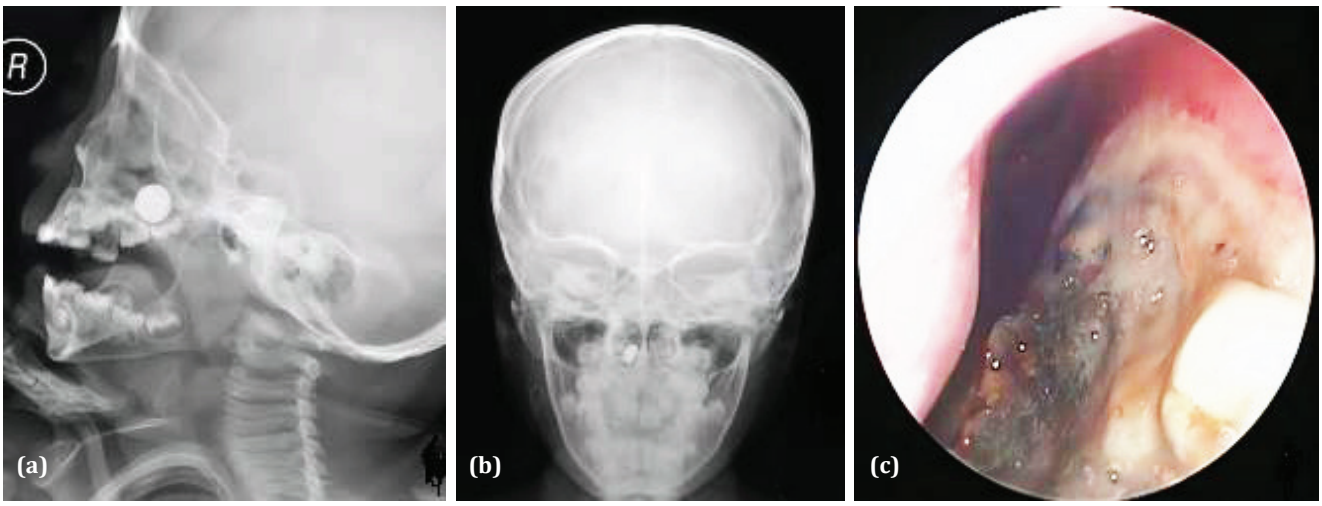

Figure 7: (a) Tablet battery in nose- Minacious foreign body, (b) Tablet battery in nose- Minacious foreign body, (c) Tablet battery in nose- Minacious foreign body.

Figure 8: Closed safety pin in nose.

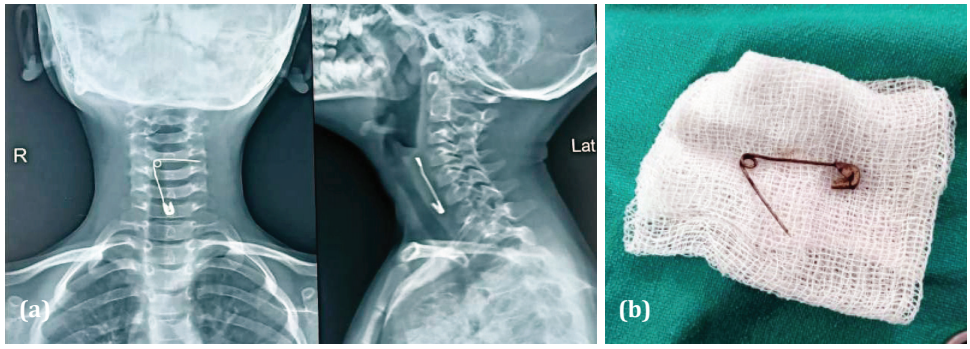

Figure 9: (a) X-ray of child with open safety pin, (b) Open safety pin after removal.

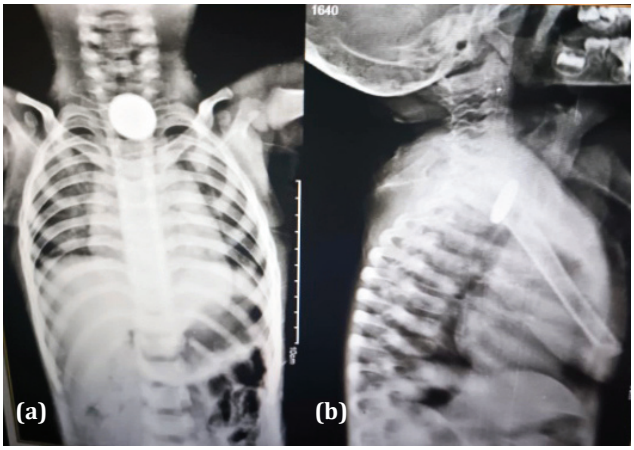

Figure 10: Coin in esophagus.

removal. So, we developed a scoring system for foreign bodies in ear and nose which constituted the majority. It was found effective in majority of cases. It not only helped with proper planning but also with counselling of parents.

Discussions

In the age group of 1-5 years patients the incidence of foreign bodies was most common in our study, which was similar to as seen in studies by Parajuli et al, Yan et al, Heim et al and Ngo et al [1, 8-10]. As per our study, we found foreign bodies mostly in right ear, which was similar as seen by Heim et al, Ngo et al and Oyama et al [9-12]. However in some studies foreign bodies were more in throat [18] whereas in another study nose was found to be the commonest site [19].

Our study population represented all socioeconomic categories. There was no preponderance of sex, economic and educational status of parents in any category which was same as in other studies [13]. However, there was significant relation with presentation of children at hospital with parent's socioeconomic status and educational status as found in other studies [14]. The family structure ranged from single to multiple siblings.

The psychosocial part of family also didn't reveal any particular abnormal trend. However, we observed that these kids were impulsive and hyperkinetic in their behavior in most instances which was comparable to study by Bakhshaee et al [3]. These kids were playful with their social counterparts and siblings. They didn't have any history of introvert behavior. The developmental

milestones of these patients were normal in most cases. So, we found that foreign body insertion in ears and nose was because of impulsive playful acts. Sometimes it was because of their observation of mothers using ornaments in nose and ears.

In age group of 5-10 years of patients we observed a definite alteration in psychosocial behavior from normalcysimilar to that seen by Bakhshaee et al [3]. Parents also consented that these kids had attention seeking behavior. They were more jealous of their siblings. They also behaved aggressively when the attempt of removal of foreign bodies was made or seeing the instruments of intervention. The parents of these patients in this category with hyperkinetic behaviors and multiple episodes of foreign body insertion were advised to consult child psychologist which was similar to as seen in study by Bakhshaee et al [3] and Turgut et al [17].

In the age group of 10-15 years of patients with feathers in ears explained that they attain pleasure by scratching their ear canal with feathers, paper rolls, cotton buds, wires, pins etc. They also complained about the sensation of persistent itching. However, their external auditory canal appeared normal clinically. In another study children in this age group with foreign body insertion had abnormal sexual behaviour [15].

Our scoring system for foreign body retrieval is unique as it provides comprehensive approach to foreign bodies in ear and nose as it constitutes the maximum number patients. However, there are scoring system available for foreign bodies in airway [20], but there is limited knowledge in previous studies on management of foreign bodies in nose and ear based on scoring system.

In cases of foreign bodies of ear with scores ranging from 5 to 8 can be taken for removal on OPD basis in a procedure room. They generally cooperated well for removal under awake situations. However, in cases of scores ranging from 9-14 were taken for removal after IPD admission under general anesthesia or sedation by anesthetist. The patients having traumatic perforation due to foreign bodies underwent necessary microsurgical repair in same sitting.

In cases of foreign bodies of nose with scores ranging from 5-7 were taken for removal in OPD procedure room. Foreign body hooks, paediatric holding forceps or suction were used to retrieve the foreign bodies. The patients with scores ranging from 8-14 were taken for removal after admission in IPD under general anesthesia. These patients often require endoscopic visualization. The foreign bodies must be retrieved as early as possible. However, in cases of impaction in ear with granulation around the foreign bodies can be advocated a course of antibiotics ear drops containing steroids for 5-7 days to subside the swelling. This helps in later intervention and attains the confidence of children along with parents. Undue delay must be avoided as it can lead to complications like abscess, perforated ear drum (in foreign bodies of ear), rhinolith, septal perforation, epistaxis (foreign bodies of nose), fistula formation (foreign bodies of esophagus and trachea).

Limitations: Limitation of our study is that this data was collected in tertiary care centre which is also functional as a referral hospital in the city, hence geographical distribution is limited and does not precisely reflect the disease profile of the community.

Conclusion

Foreign bodies in Otorhinolaryngology in the paediatric patients require prompt and adequate management. The method of treatment depends on the location and type of foreign body. Furthermore, it should be performed by an experienced health professional or otolaryngologist without delay to prevent the development of possible complications. However, prevention is the best option; therefore, the greatest possible attention should be paid to toys and food within reach of children, bearing in mind their age, by parents, babysitters and teachers. The manufacturers of toys and food should necessarily highlight the potential danger for children on the product label. Therefore, there is a need for education about foreign bodies at all levels of society that include children in their scope. The study also helped us categorize our patient in terms of management modality through our devised scoring system.

Conflicts of interest

Authors declare no conflicts of interest.

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