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Ear Nose Throat Foreign Bodies in Children: Impact of the COVID-19 Pandemic

ABSTRACT

Background: This study aimed to analyze the incidence of ear, nose, and throat foreign bodies in children in a tertiary reference center to determine whether the coronavirus disease-19 lockdown affected the frequency of hospital attendance.

Methods: A total of 752 children (aged 0-18) with ear, nose, and throat foreign bodies, who visited the otorhinolaryngology emergency department of a tertiary reference center between March 2019 and February 2021, were reviewed retrospectively. The 2 groups were formed based on the hospital admission date. Group 1 included patients admitted to the otorhinolaryngology emergency department in the 1-year pre-pandemic period from March 2019 to February 2020. Group 2 included patients admitted within the same timeframe during the pandemic (March 2020–February 2021). The age and sex of the patients and anatomic location and type of foreign body were compared between the 2 groups.

Results: No significant differences were detected between the 2 groups regarding the number of patients, age, sex, anatomic location of foreign body, or type of foreign body. Although not significant, the rate of exposure to dangerous foreign bodies such as sharp objects and magnets/batteries increased during the pandemic.

Conclusion: Our study shows that the coronavirus-19 pandemic had no impact on the frequency of hospital attendance and anatomic location or type of foreign bodies inserted in the ear, nose, and throat. A slight increase in the frequency of dangerous foreign body exposure might be important due to the higher morbidity rate.

Keywords: COVID-19 pandemic, foreign bodies, ear canal, nasal cavity, oropharynx

INTRODUCTION

Ear, nose, and throat (ENT) foreign bodies (FBs) are detected frequently in routine medical practice by general practitioners, emergency department physicians, and otorhinolaryngologists. Foreign bodies are considered to account for 11% of the ENT emergency cases.[1] Foreign bodies may cause severe conditions due to the anatomical site involved, size, shape, and chemical composition of the FB.[2] Ear, nose, and throat FBs are encountered more commonly in younger infants due to cognitive immaturity, curiosity for exploring orifices, playing, boredom, and inattention of caregivers.[1]

The novel coronavirus disease 2019 (COVID-19) was declared a global pandemic on March 11, 2020, by the World Health Organization.[3] In order to reduce the rapid virus spread, a national lockdown was announced in our country on March 16, 2020. Working parents were forced to stay at home, and daycare centers and schools were closed completely.

Our study aimed to analyze the incidence of ENT FBs in children in a tertiary reference center to determine whether the COVID-19 lockdown affected the frequency of hospital attendance. The 1-year pre-pandemic period (March 2019-February 2020) was compared with the exact same timeframe during the pandemic (March 2020–February 2021). Although the prohibition of all nonessential travel, limitation of public transportation, and potential fear of getting COVID led to reluctance in seeking medical care, we hypothesized that due to the COVID lockdown and increased home isolation, the frequency of ENT FB exposure would be higher during the pandemic.

Özlem Bayram
Işıl Taylan Cebi

Department of Otorhinolaryngology Head Neck Surgery, Haseki Training and Research Hospital, Istanbul, Turkey

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Corresponding author:
Işıl Taylan Cebi
Email: *drisiltaylan@hotmail.com*
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MATERIAL AND METHODS

A total of 752 children (aged 0-18) with ENT FBs, who visited the ENT emergency department of a tertiary reference center between March 2019 and February 2021, were included in our study. The 2 groups were formed based on the hospital admission date. Group 1 included patients admitted to the ENT emergency department in the 1-year pre-pandemic period from March 2019 to February 2020. Group 2 included patients admitted within the same timeframe during the pandemic (March 2020—February 2021). The age and sex of the patients and the anatomic location and type of FB were reviewed retrospectively. The anatomic location of FB was listed as external ear canal, nasal cavity, oropharynx, esophagus, and larynx/trachea. Six main categories were created due to the type of FB: (a) inorganic materials such as toys, small plastics, pebbles, sand, and paper; (b) organic materials such as food pieces, fruit seeds, beans, and fish bones; (c) jewelery; (d) magnets and batteries; (e) sharp objects such as needles, screws, and safety pins; and (f) coins.

A complete ENT examination was performed, and flexible nasopharyngoscopy and additional radiological evaluation (e.g., x-ray) were done when needed.

The study was approved by the Haseki Training and Research Hospital institutional review board (protocol no: 104-2021), and the principles of Helsinki Declaration were applied. An informed written consent was granted by the legal guardians of all patients for the study.

Statistical Analysis

The data were analyzed by the Statistical Package for Social Sciences 15.0 for Windows (SPSS Inc.; Chicago, IL, USA). Descriptive statistics were mentioned as frequencies and percentages for categorical variables and as means (± SD) or medians (minimum—maximum) for numeric variables. The comparison of the 2 groups was done by the Chi-square test. The numeric variables in the 2 independent groups did not meet the normal distribution criteria; therefore, Mann—Whitney *U* test was used for comparison. The *P*-values <.05 were accepted as statistically significant.

MAIN POINTS

- Foreign bodies are considered to account for 11% of the otorhinolaryngology emergency cases.
- Foreign bodies may cause severe conditions due to the anatomical site involved, size, shape, and chemical composition of the foreign body.
- The coronavirus disease 2019 pandemic caused unexpected changes in the lifestyle of families such as increased screen time at home and reduced outdoor playing time.
- No significant difference in the frequency of hospital attendance for ear, nose, and throat foreign bodies during the coronavirus disease 2019 lockdown is detected.
- There is a slight increase in the frequency of dangerous object exposure such as magnets/batteries and sharp objects in the coronavirus disease 2019 lockdown period.

RESULTS

Of the 752 children enrolled in the study, 405 were female and 347 were male. The mean age was 4.54 ± 3.14 (mean ± SD). Eighty-four percent of the patients were in newborn, toddler, and preschool age groups (0-6 years) and 16% of patients were in school-age and adolescent groups (6-18 years). The demographic characteristics of all patients are given in Table 1.

The 2 groups were formed based on the hospital admission date. Group 1 included 352 patients, who visited the ENT emergency department before the COVID-19 pandemic. Group 2 included 400 patients who visited the ENT emergency department during the COVID-19 pandemic. No significant difference was detected between the 2 groups regarding the number of patients, age, sex and anatomic location or type of FB. Although not statistically significant, the rate of exposure to sharp objects and magnets/batteries increased during the pandemic. The data regarding the comparison of these 2 groups are given in Table 2.

When all patients were considered, FBs were most commonly detected in the nasal cavity (65.17%) followed by the external

Table 1. Demographic Characteristics of All Patients

Age, n (%)	0-6 years	632 (84.0)
	6-18 years	120 (16.0)
Age, mean ± SD	4.54 ± 3.14	
Sex, n (%)	Female	405 (53.9)
	Male	347 (46.1)

Table 2. Comparison of Pre-pandemic and Pandemic Periods with Respect to the Age and Sex of Patients and Type and Location of the FBs Encountered

		Group 1	Group 2	*P*
Age, n (%)	0-6 years	291 (82.6)	341 (85.3)	.295
	6-18 years	61 (17.4)	59 (14.7)	
Sex, n (%)	Female	185 (52.6)	220 (55.0)	.480
	Male	167 (47.4)	180 (45.0)	
Total		352 (46.8)	400 (53.2)	.087
Anatomic location of the FBs	External ear canal	116 (33.05)	110 (27.43)	.119
	Nasal cavity	217 (61.58)	273 (68.33)	
	Oropharynx	16 (4.52)	17 (4.24)	
	Esophagus	1 (0.28)	0 (0.00)	
	Larynx/ trachea	2 (0.56)	0 (0.00)	
Type of the FBs	Inorganic materials	215 (61.08)	221 (55.25)	.123
	Organic materials	110 (31.25)	132 (33.00)	
	Jewelry	18 (5.11)	21 (5.25)	
	Magnets/ batteries	5 (1.42)	17 (4.25)	
	Sharp objects	3 (0.85)	8 (2.00)	
	Coins	1 (0.28)	1 (0.25)	

FB, foreign body.

Table 3. Overall Distribution of the FB Types and Anatomic Locations

FBs, n (%)	External Ear Canal	Nasal Cavity	Oropharynx	Esophagus	Larynx / Trachea	Total
Inorganic materials	155 (68.6)	278 (56.7)	2 (6.1)	0 (0.0)	1 (50.0)	436 (57.98)
Organic materials	29 (12.8)	184 (37.6)	28 (84.9)	0 (0.0)	1 (50.0)	242 (32.18)
Jewelry	30 (13.3)	9 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)	39 (5.19)
Magnets/batteries	7 (3.1)	14 (2.9)	1 (3.0)	0 (0.0)	0 (0.0)	22 (2.93)
Sharp objects	5 (2.2)	4 (0.8)	2 (6.1)	0 (0.0)	0 (0.0)	11 (1.46)
Coins	0 (0.0)	1 (0.2)	0 (0.0)	1 (100.0)	0 (0.0)	2 (0.26)
Total	226 (30.07)	490 (65.17)	33 (4.37)	1 (0.13)	2 (0.26)	752 (100.0)

FB, foreign body.

ear canal (30.07%). In all patients, the most common type of FB encountered were inorganic materials such as toys, small plastics, pebbles, sand, and paper. The most common locations for inorganic materials were the external ear canal and the nasal cavity. However, organic materials such as fish bones, fruit seeds, beans, and food pieces were mostly detected at the oropharynx. The overall distribution of the anatomic location and type of FBs are given in Table 3.

DISCUSSION

Foreign bodies account for 11% of the ENT emergency cases.[1] If not managed on time, FBs may cause severe morbidity/mortality due to the anatomical site involved (e.g., larynx/trachea), size, shape (e.g., needles and screws), and chemical composition (e.g., magnets/batteries).[2] The ear, nose, and throat FBs are encountered more commonly in younger infants due to cognitive immaturity, curiosity for exploring orifices, playing, boredom, mimicking the adults' habits of ear and nose picking, and inattention of caregivers.[1] The mean age of patients with ENT FB was reported as 6 years or younger in several studies.[1,4-6] The mean age in our study was 4.54 ± 3.14 years, which is consistent with those studies. There was a negligible female dominance in the present study in both groups, which is also consistent with the previous studies.[1,5,7]

The present study aimed to analyze the incidence of cases with ENT FBs visiting a tertiary reference center in the pre-COVID and COVID period and to detect the impact of COVID-19 lockdown on the frequency of hospital attendance. At the beginning of the COVID-19 pandemic, strict measures were taken in order to reduce the rapid virus spread which resulted in unexpected changes in the lifestyle of families. The closure of schools and daycares, where the children mostly socialize, reduced outdoor playing time due to lockdown and increased screen time at home, resulting in psychological distress in children.[8,9] In addition, home isolation might have increased the domestic accidents such as FB insertion in ENT. Therefore, we hypothesized that the frequency of ENT FB exposure would be higher in the COVID period.

The results of the present study show that there was no significant difference in the frequency of hospital attendance, age and sex of the patients, and anatomic location or type of FB in pre-COVID and COVID periods. However, a slight increase in the frequency of dangerous objects such as magnets/batteries and sharp objects was detected during the COVID period. This might be due to the increased time spent indoors and the use of electronic devices/toys. This finding is important because the morbidity of batteries is higher due to the corrosive nature of their contents. Pizzol et al reviewed the FB ingestions in children during the COVID-19 period and compared it with the same time frame in the previous 4 years. No significant difference in the hospital admission rate was detected. However, there was a significant increase in the rate of battery ingestion during the COVID-19 pandemic.[6] The unchanged frequency of hospital attendance for FBs in pre-COVID and COVID periods in the present study reflects the continuous risk. Garg et al[10] studied 196 patients presenting with ENT FB between March and August 2019 and the same period in 2020, and no significant difference in the frequency of hospital attendance was detected. Contrarily, Roy et al claimed a significant reduction in the number of nasal FB attendance at healthcare facilities due to the COVID-19 quarantine and fear of getting COVID. However, they stated that more complicated cases presented right after the quarantine period.[11]

In the present study, FBs were most commonly encountered in the nasal cavity (65.17%) which was followed by the external ear canal (30.07%) and the oropharynx (4.37%). However, the rate of FBs in the upper aerodigestive tract was extremely low (0.13% in the esophagus and 0.26% in the larynx/trachea). Garg et al found that the most common location for ENT FBs was the nose (49% in 2019 and 47% in 2020), which was followed by the ear (44% in 2019 and 36% in 2020). The FBs in the throat was doubled during the pandemic (17%) compared with 2019 (7%) but not statistically significant.[10] Mukherjee et al[4] showed that most of the FB insertions were in the nose (44.4%) followed by ear and throat (38.9% and 16.7%, respectively). The data of these studies are consistent with the present study.[4,10] Loperfido et al[5] reviewed 1623 pediatric FBs and detected that ear FBs were most common, followed by nose, pharynx, and mouth. The rate of larynx/trachea FBs was 0.8%. Awad et al[1] claimed that the most common location of ENT FBs was the upper digestive tract (53.7%), followed by the ear (24.68%) and nose (18.95%). The rate of inhaled FBs was insignificant (2.67%).[1] The low percentages of esophagus and larynx/trachea FBs in most studies, as well as our study, might suggest that caregivers are more alert and precautious about the upper aerodigestive tract FBs. In addition, coughing and/or vomiting reflexes are usually evoked by the FBs of the upper aerodigestive tract, which results in spontaneous elimination on many occasions.

In the present study, FBs in the external ear canal and nasal cavity were mostly inorganic materials such as toys, small plastics,

pebbles, sand, and paper. Organic materials such as food pieces, fruit seeds, beans, and fish bones were predominantly detected at the oropharynx. This might be due to eating during playtime, immaturity of the teeth, and inefficient swallowing. Sharp objects were most commonly seen at the oropharynx as well. Coins were detected only in 1 patient, at the esophagus. In the study of Awad et al,[1] beads were the most common FBs detected in the nose and ear, and coins were detected mostly in the upper digestive tract. Ansley and Cunningham reported that the most common FBs in the ear were beads, plastic toys, and pebbles.[12] These findings are consistent with the present study.

The strength of the present study is the thorough review of the incidence of ENT FBs, FB types, and anatomic locations of FBs during the pre-COVID and COVID periods. The main limitation is the limited number of esophagus and larynx/trachea FBs despite the large sample size. This might be due to both the aforementioned reasons and the management of several cases by the Thoracic Surgery Department.

CONCLUSION

Our study shows that there was no significant difference in the frequency of hospital attendance, age and sex of patients, anatomic location, or type of FBs in pre-COVID and COVID periods. However, a slight increase in the frequency of dangerous object exposure such as magnets/batteries and sharp objects was detected during the COVID period. It might be due to the increased time spent indoors and the use of electronic devices/toys. This finding is important because of the higher morbidity of such objects.

Ethics Committee Approval: Ethical committee approval was received from the Haseki Training and Research Hospital institutional review board (Protocol no: 104-2021 Date: 22.12.2021)

Informed Consent: Informed written consent was obtained from the legal guardians of all participants.

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