Correlation between Nasal Foreign Bodies and Their Presentation in Paediatric Age Group

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Abstract

Objectives: To observe the relationship of nasal foreign bodies in terms of patient’s age as well as the type of foreign body and removal technique.

Materials and Methods: This analytical cross-sectional study was conducted in the ENT department, from April 2017 to May 2018. After acquiring approval from Institutional Review Board (IRB), vide letter No. 1.60.IMDC-2017, a total of 120 patients selected by non-probability consecutive sampling technique with inclusion criteria of all children less than 12 years with a foreign body in the nose were recruited for this study after taking written informed consent. Patients with suspected rhinoliths and symptoms suggestive of the foreign body but examination showed no foreign object were excluded. Children's age, gender, size, type of foreign body, and removal technique were recorded. Data were analyzed by using SPSS version 21.

Results: A total of 120 patients were presented with nasal foreign bodies, 107 cases were successfully dealt with in OPD while 13 patients were admitted for removal under general anaesthesia. The commonest affected age group was 2-5 years (78.33%) with more females (55.75%) than males (44.25%). The organic type of foreign body was 55.8% and the inorganic type of foreign body was 44.2%. Seeds and small nuts (35%) were found to be the commonest types of nasal foreign body. The correlation between age groups, types of foreign body, removal technique, and site of foreign body was significant (p-value ≤ 0.05).

Conclusion: Nasal foreign bodies are a commonly faced problem in children, especially in 2-5 years of age. They are largely harmless but complications can occur if neglected.

Keywords: Age groups; Foreign bodies; Nasal obstruction; Pediatrics.
Introduction

A nasal foreign body is one of the most commonest emergencies of Ear, Nose, and Throat (ENT) in children aged 2-5 years.\textsuperscript{1} When children start moving without adult supervision, they approach numerous objects that must be found promptly. The position of objects in orifices is essentially on the right side because of the predominant hand.\textsuperscript{2} The basic reasons for nasal foreign bodies in children may be incorporate identification, curiosity, simulation, mentally ill, and hyperactivity disorder.\textsuperscript{3} Foreign bodies are classified as inorganic and organic materials. The earlier are usually plastic, for example, beads, buttons, stones, paper, or little parts from toys; they are frequently asymptomatic and are typically found by chance. Organic material like peanuts and beans may create earlier symptoms because they tend to irritate the nasal mucosa.\textsuperscript{4} Children ordinarily present foreign body in the nose during playing dominantly on the right side\textsuperscript{5} which vary widely in type, shape, and size like toys, household or different things and they may end up in any part of the nasal fossa but are most commonly found in anterior to the middle turbinate or beneath the inferior turbinate.\textsuperscript{6} They usually present with a one-sided foul smell, purulent nasal discharge, sneezing, epistaxis, nasal blockage, and pain whenever neglected or in other cases may be asymptomatic whenever detected earlier by the parents.\textsuperscript{6} Nasal foreign bodies are diagnosed by ENT specialists on anterior rhinoscopy, flexible or rigid nasal endoscopy after instilling topical vasoconstrictor to enable the examination because some foreign bodies, for example, vegetables which retain water from the tissues and induce a severe inflammatory response that can produce toxemia.\textsuperscript{7}

Different techniques for nasal foreign bodies removal include Jobson Horne probe, foreign body hook, crocodile forceps, suctioning or Eustachian tube catheter relying on the type and nature of the object.\textsuperscript{8} Neglected foreign bodies, commonly lead to Rhinolith formation but serious complications like erosion and development of infection into the surrounding structures including acute sinusitis, otitis media, or periorbital cellulitis along with toxic shock syndrome can also occur.\textsuperscript{9} Removal of a nasal foreign body is not always easy, it relies upon its site and size and the cooperation of the children along with proper instruments and skills of the health professional. Nasal foreign bodies are usually removed on an OPD basis while already attempted cases, restless and non-cooperative patients required admission and then general anesthesia for its removal, which is preferred to stay away from the acute life-threatening complications.\textsuperscript{10}

This study aimed to determine the relationship between common presentation and management outcomes in the cases of nasal foreign bodies. The hypothesis of the study, the relationship between children's age group and type of foreign body, type of removal technique, and site of foreign body was significant.

Materials and Methods

An analytical cross-sectional study was performed in the outpatient department of ENT, from April 2017 to May 2018. After taking approval of hospital ethical committee to vide letter No. 1.60.IMDC-2017 and informed written consent to parents of children, a total of 120 patients (sample size was calculated by WHO sample size calculator; whereas the following parameters were used, desire precision was 9%, CI; 95%, margin of error, 5% and prevalence was 12%).\textsuperscript{10,11} The study population was included, the patient's age range from 2 to 10 years, presented with nasal foreign bodies or unilateral nasal discharge with or without foul smell. Patients with suspected rhinoliths and symptoms suggestive of the foreign body but examination showed no foreign objects were excluded from the study. Non-probability consecutive sampling was used for enrolling the patients in this study. The following procedure was done for data collection. Anterior rhinoscopy and suction toilet (if required) were done to diagnose nasal foreign bodies. General anesthesia and with or without local anesthesia were used to remove the nasal foreign bodies, the patient who is usually a child is placed in the upright sitting position, the head is tilted slightly backward to visualize the floor of the nose for routine otorhinological examination and this an adult may need to confine a child and fixed the head by holding firmly and the object is then removed by using either an instrument such as nasal foreign body hook, Jobson Horne probe, crocodile forceps, suction toilet or Eustachian tube catheter. Data was collected through self-structured proforma as well as demographic details. Types of foreign bodies, site of nasal foreign bodies, types of techniques for removal of foreign bodies, age, and gender of patients were analyzed. The collected data was analyzed using a computer program statistical package of social science (SPSS) version 21. The results were presented in the form of descriptive analysis. The qualitative variables were
presented as percentages and quantitative variables as mean and standard deviation. Pearson correlation was used between types of foreign bodies and types of techniques for removal and site of nasal foreign bodies.

Results

One hundred and twenty (120) patients were visited with a nasal foreign body. Primarily pediatric age group was involved, 96 (80%) 2-5 years old and 22 (18.33%) were 6-10 years of age group. The rate of incidence is decremental in 5 years, still, 2 cases (1.67%) were found after 10 years of age. Out of 120 children, 53 (44.16%) were male and 67 (55.83%) were female. The gender segregation showed female predominance with male to female ratio is 1:1.26. Out of 120 children with nasal foreign bodies, 13 (10.83%) required general anesthesia and the rest 107 (89.16%) were removed in the outpatient department with or without local anesthesia.

Types of foreign bodies were organic and inorganic, out of 120 children 67 (55.8%) had organic foreign bodies and 53 (44.2%) had inorganic foreign bodies. The majority of the patient with the nasal foreign body in this study group presented were asymptomatic 44 (36.66%), followed by foul-smelling nasal odour 36 (30%) and unilateral nasal discharge 33 (27.5%). A small proportion presented with nasal obstruction 3 (2.5%), bleeding from nose 3 (2.5%), and discomfort in only one case (0.84%).

We observed that the most common type of foreign body was seeds 42 (35%), followed by plastic beads 21 (17.5%), others 14 (11.66%) and batteries 10 (8.33%), foam 9 (7.5%), paper 9 (7.5%), rubber 7 (5.83%), buttons 6 (5%) are also found. In all cases, removal was done with direct instrumentation either by extraction or by suction.

<table>
<thead>
<tr>
<th>Types of foreign bodies</th>
<th>Organic</th>
<th>Inorganic</th>
<th>Total</th>
<th>Chi-square value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>67 (55.8%)</td>
<td>53 (44.2%)</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Association between age groups and type of foreign body, (n=120)

<table>
<thead>
<tr>
<th>Types of removal technique</th>
<th>Suction</th>
<th>Extraction</th>
<th>Total</th>
<th>Chi-square value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suction</td>
<td>37 (38.5%)</td>
<td>59 (61.5%)</td>
<td>96</td>
<td>10.091</td>
<td>0.006</td>
</tr>
<tr>
<td>Extraction</td>
<td>16 (72.7%)</td>
<td>6 (27.3%)</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53 (44.2%)</td>
<td>67 (55.8%)</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Association between age groups and removal technique of foreign body, (n=120)

In most patients, the foreign body had obstructed the right nasal cavity 71 (59.17%), as compared to the left nasal cavity 49 (40.83%).

<table>
<thead>
<tr>
<th>Site of foreign body</th>
<th>Right nostril</th>
<th>Left nostril</th>
<th>Total</th>
<th>Chi-square value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 years</td>
<td>61 (63.5%)</td>
<td>35 (36.5%)</td>
<td>96</td>
<td>6.876</td>
<td>0.032</td>
</tr>
<tr>
<td>6-10 years</td>
<td>8 (36.4%)</td>
<td>14 (63.6%)</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 10 years</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>71 (59.2%)</td>
<td>49 (40.8%)</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Association between age groups and site of foreign body, (n=120)
Table 4: Correlation between age groups, types of foreign body, removal technique, and site of foreign body, (n=120)

<table>
<thead>
<tr>
<th></th>
<th>Age groups</th>
<th>Types of foreign bodies</th>
<th>Removal technique</th>
<th>Site of foreign body</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age groups</strong></td>
<td>Pearson Correlation 1</td>
<td>.280**</td>
<td>-.168</td>
<td>.127</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) -</td>
<td>.002</td>
<td>.066</td>
<td>.166</td>
</tr>
<tr>
<td><strong>Types of foreign bodies</strong></td>
<td>Pearson Correlation .280**</td>
<td>1</td>
<td>.487**</td>
<td>-500**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .002</td>
<td>-</td>
<td>.0001</td>
<td>-</td>
</tr>
<tr>
<td><strong>Removal technique</strong></td>
<td>Pearson Correlation -.168</td>
<td>.487**</td>
<td>1</td>
<td>-.934**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .066</td>
<td>.0001</td>
<td>-</td>
<td>.0001</td>
</tr>
<tr>
<td><strong>Site of foreign body</strong></td>
<td>Pearson Correlation .127</td>
<td>-.500**</td>
<td>-.934**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .166</td>
<td>.0001</td>
<td>.0001</td>
<td>-</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level**

Discussion

In this study, a total of one hundred and twenty patients were enrolled, the commonly affected age group was 2-3 years whereas the frequently affected pediatric population was seen under the age of 5 years. Nasal foreign bodies are a common pediatric problem that comes across in daily practice, frequently seen less than 5 years of age. A study conducted by Salih et al majority of the children were presented with the nasal foreign body between the ages of 2 to 5 years.

Bakhshaee et al study show, the 0-3 years age group are close to our study whereas Rodriguez et al found half of the cases of similar age which is contrary to our findings. Another study conducted by Hira et al on Turkish children, the age group was 3 years and they found almost half of the cases, which is in accordance with our findings. We found, female predominance with a female to male ratio of 1.26:1 which is comparable with the female to the male ratio found in other studies. In some published literature, they found male dominance which was in contrast to our findings.

The patient’s presentation to the hospital depends on the type and duration of the foreign body along with the circumstances of the mishap. In the event that somebody knows about the occurrence, the child is rushed to the hospital either immediately or within 24 hours. Although nasal foreign bodies are symptomless if it is neglected, they can present with symptoms. In our study, we found almost one-third asymptomatic whereas the rest of the patients with foul-smelling odour and unilateral nasal discharge which is similar to a study by Hira et al.

Different studies showed different types of foreign bodies depending on the surroundings and availability of the objects, whereas in our study seeds and small nuts were most common which is almost similar to the studies done by Regonne et al but in contrast to the study by Awad & ElTaher. Button batteries are the most dangerous of all foreign bodies which need urgent and special attention to remove because they can lead to complications from abrasion of mucosa to perforation of the septum and even palate because when it comes in contact with a wet surface, has a tendency to cause liquefactive necrosis. In our study 10 patients were found with batteries in the nose which is close to the study by Scholes et al while some other authors have shown different results.

The right nasal cavity as the site of foreign body insertion was common in our study which is almost similar to the study conducted by other studies. These findings are possibly due to the predominance of right-handedness in the human population.

Nasal foreign bodies are removed by different techniques both instrumental and non-instrumental in which proper positioning, adequate light, and handling the patient is important for successful removal of the object otherwise can lead to a serious and life-threatening problem of pushing the foreign body into the respiratory tract. Oya et al reported that children between 1-3 years have the highest incidence of foreign body aspiration while we didn’t find any case in our study.

In our study, all of 120 patients had their foreign body removed by direct instrumentation either by nasal foreign body hook, Jobson Horne probe, and Eustachian tube catheter in most of the children while few required nasal suctioning. Whereas, some patients needed removal of a foreign body under general anesthesia which is close to the study conducted by Oh et al. Non-instrumental procedures like posterior displacement, irrigation, or positive pressure either by parent kissing or Ambu bag were not required in our study.
**Conclusion**

**Recommendations of study:** Children under 5 years of age are more prone to foreign body nose which could be life-threatening. Prevention remains the best strategy; we recommend that children should not be given toys that are insert-able in the nose. Children with unilateral foul-smelling nasal discharge should be thoroughly assessed for the foreign body. A competent doctor is required for successful extraction without complications.

Nasal foreign bodies are commonly faced problems in children, especially in 2-5 years of age in routine ENT practice. Although they are largely harmless but complications can occur if neglected.

**References**