Will children ever learn? Removal of nasal and aural foreign bodies: a study of hospital episode statistics

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ABSTRACT

INTRODUCTION Foreign body removal is a common reason for children to attend the emergency department. Generally, aural and nasal foreign bodies are not associated with immediate morbidity unless they are button batteries. There can be consequences of migration and removal.

METHODS Hospital Episode Statistics for 2010–2016 were used to calculate the number of nasal and aural foreign bodies that have been removed in hospital. Data for adults and children have been compared.

RESULTS 8752 nasal and 17,325 aural foreign bodies have been removed from adults and children over the course of 6 years. Children were responsible for 95% of the 8353 nasal and 85% of the 14,875 aural foreign body presentations. Children aged 1–4 years are most at risk of injury.

CONCLUSION Children are more likely to present to hospital than adults with a foreign body in the ear or nose. Aural bodies were more likely to need removal in hospital for both populations. Authors believe that these require identification and removal by an ear, nose and throat specialist to prevent morbidity. The overall number of procedures performed annually in children has not reduced over the study period; an average of 1218 nasal and 2479 aural foreign body removals are performed each year with an annual cost of £2,880,148 to NHS England.

KEYWORDS

Otolaryngology – Foreign body – Ear – Nose – Incidence

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Introduction

Foreign body removal is a common reason for young children to present to the emergency department. In children, this is most frequently due to toys, sweets and rocks; however in adults cotton ear-buds are a leading cause.¹ The presence of a foreign body in the nose and auditory canal is not usually life threatening, but they can be associated with morbidity, especially if the foreign body is a button battery.² Migration of a nasal foreign body into the airway or the removal of a foreign body from the aural canal in an uncooperative child is a well-recognised risk; however, there is little evidence that this is a significant risk.³

Hospital Episodes Statistics (HES) are a dataset containing records of all patients admitted to NHS hospitals in England and relevant procedures performed.⁴ The data do not give specific individual information but do give an outline of the current surgical rates in England. The data on 'Main procedures and interventions' is subdivided into four-character OPCS-4 codes relating to specific

procedures and the relevant trends. This study aims to identify the number of procedures performed in children and determine any change over the study period. Secondary aims were to review identical data in the adult population as a comparison.

Materials and methods

'Main procedures and interventions' data for the available years (2010–2016) were downloaded in Excel format from the Department of Health records.⁴ The operative (OPCS-4) codes D07.3 relating to the removal of a foreign body from the ear and E08.5 relating to the removal of a foreign body from the nose were considered and corresponding data collected. The data on bed days were also collected. 'FCE (finished consultant episode) bed days' is the total number of individual days spent in hospital under a certain consultant. The data available from Department of Health records were collected and stored as children (ages 0–14 years) and adults (ages 15–75+ years); therefore, for the purpose

of this study, adults were considered to be those aged 15 years and above. Costing data were taken from the NHS England National Tariff Workbook, with the following codes: Adult Ear (CA36A), Child Ear (CA36B), Adult Nose (CA25A) and Child Nose (CA25B).⁵ The authors assumed that all HES data had been coded and entered correctly. HES are based on the number of hospital episodes rather than individuals. As a result, the results cannot be interpreted as a count of people presenting, since some people may have been admitted more than once. In addition, HES only account for the foreign bodies removed in hospital, not in primary care.

Results

Between 2010 and 2016, 26,051 foreign bodies were removed from nasal cavities and auditory canals, with a total cost to NHS England of £2,880,148 per annum.⁵ Of the 8754 foreign bodies removed from the nasal cavity, 8353 (95.4%) were in children and 401 (4.6%) in adults. This equates to the removal of on average 1459 foreign bodies per annum. This required 2471 bed days over the course of 6 years (411 bed days a year).

Of the 17,325 foreign bodies removed from the auditory canal, 14,875 (85.9%) were in children and 2445 (14.1%) were in adults. This is on average 2887 foreign bodies per annum. This resulted in 2075 bed days being required over the 6-year period (345 bed days a year). Sub-analysis of the age group data from 2012/13 to 2015/16 shows that children aged 1–4 years are most likely to present with a nasal foreign body and those aged 5–9 years with an aural foreign body (Fig 1). Children aged 1–4 years account for 58.5% of foreign body presentations during this period.

The cost of these procedures to NHS England is conservatively estimated at £148,961 per year for removal of paediatric and £6,950 per year for adult nasal foreign bodies.⁵ Similarly, the cost was £2,402,312 per year for

removal of paediatric aural foreign bodies and £521,925 per year for those in adults. This equates to approximately £2,880,148 per annum (Table 1).

Discussion

The study of foreign bodies is fascinating, owing to the common peculiarities of presentation. Ear, nose and throat (ENT) surgeons primarily deal with the most common bodily orifices exposed to foreign body insertion: the mouth, nose and ears. No paper has attempted to previously identify or study the UK's foreign body insertion habits, especially regarding ear, nose and throat presentations.

Over 4000 foreign bodies are removed from the UK's nasal and aural cavities each year since 2010. This has resulted in approximately 750 bed days a year. Both children and adults were more likely to seek help for an aural compared with a nasal foreign body, with children accounting for approximately 85–95% of all foreign body cases. This has also been shown in the international literature.⁶

Sub-analysis of the paediatric data between 2012/13 and 2015/16 shows that children aged 1–4 years are most likely to present with a foreign body in the nose and those aged 5–9 years with something in the ear. However, children aged 1–4 years account for the highest number of presentations overall and are thus most at risk of further injury.

Overall, items of jewellery are the most common foreign bodies requiring removal in children, accounting for up to 40% of cases. In the nose, jewellery is followed by paper and plastic toys, whereas in the ears, cotton buds and pencils are the most likely culprits after jewellery.^{7,8} International data show that emergency department staff can resolve the majority of cases, with 86% success rates for nasal objects, 72% for aural objects and 67% in aerodigestive objects. The remainder require ENT specialist input and may require a prolonged inpatient stay.⁹ As a result of this prevalence, the data suggest that nearly £3 million is

Figure 1 Number of aural and nasal foreign body episodes in the UK according to child age group, 2012–2016.

Table 1 Rates of nasal and aural foreign body removal in the UK, 2010–2016.

Year	Nose		Ear		Total
	Child	Adult	Child	Adult	
2010/11	1395	47	2503	421	4366
2011/12	1565	54	2423	350	4392
2012/13	1395	68	2375	348	4186
2013/14	1368	70	2550	409	4397
2014/15	1373	69	2504	453	4399
2015/16	1257	65	2520	469	4311
Totals	8726		17325		26051

Child: 0–14 years; adult: 15–75+ years (Department of Health classification).

being spent in NHS England each year on presentations for aural and nasal foreign body removal. This demonstrates a burden to NHS England’s bed situation and budget.

The occurrence of foreign bodies in children is generally attributed to curiosity, a whim to explore orifices and accidental entry of the foreign body. In adults, habitual cleaning of ears with cotton buds is likely to be the leading cause.^{10,11}

Removal of aural foreign bodies can be a hazardous procedure. Evidence suggests these cases are best managed by ENT specialists under microscopic vision, to minimise auditory canal trauma in the emergency department. Nonetheless, uncooperative children will require general anaesthesia.¹² Trauma to the auditory canal is a hazard with aural foreign body removal, but complications are minimised if removal is completed by an ENT specialist. Thus, evidence suggests that patients should be referred after one failed attempt in the emergency department.

Nasal foreign bodies may have a delayed presentation, leading to foul-smelling mucopurulent discharge.¹² A child presenting with these symptoms should be treated as having a foreign body until proven otherwise. These foreign bodies are most commonly located between the septum and inferior turbinate, which means that they may be located easily using a Thudicum’s speculum or rhinoscopy. It is imperative that these bodies are identified and removed early, to prevent migration to the upper airways and thus causing a potentially life-threatening obstruction.

Button batteries are not uncommon foreign bodies in children and they require immediate removal by ENT specialists, irrespective of whether they are in the ear, nose or upper aerodigestive tract. Batteries need only be present for a very short period of time before they cause an

electrochemical reaction with the surrounding tissues of the ear canal, tympanic membrane and nose. Removal alone may be insufficient to prevent further local damage. This further supports the need for early ENT input in the child’s care.²

The authors believe that foreign bodies are likely to be a growing issue, particularly with the rising availability of electronic toys and, as a result, the prevalence of foreign body ingestion of hazardous batteries may rise. Surveillance projects have been set up to monitor, provide risk-analysis and raise awareness of foreign body injuries in children.¹³ However, we have shown that more needs to be done in the UK to help reduce the numbers suffering foreign body injuries and presenting to the emergency department for removal.

The authors believe that stronger legislation may be required to ensure manufacturers are warning consumers about the risks of using certain devices around young children and to emphasise the importance of recognising children who may have ingested a foreign body.

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