Pediatric Otolaryngological Emergency: An Experience from a Tertiary Care Teaching Institution at Kolkata, India

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Abstract Otolaryngological conditions constitute a major share of emergency medical problem among children. The present study was conducted to assess the patient profiles, incidences morbidities, mode of presentation and managements of different otolaryngological emergencies among pediatric patients presented in a tertiary care hospital. Descriptive cross-sectional study by analysing retrospectively collected information pertaining to the patients attended ENT emergency service department of a tertiary care hospital, Kolkata. Data were collected using predesigned proforma and were analysed with the help of SPSS version 20. About 39.0% of total ENT emergency attendance was contributed by pediatric age group. The male female ratio was 1:1.33 with average age of 58.95 ± 34.42 (mean $\pm$ SD) months. Half of the attendees had ear problem and almost one-third reported complaints related to nose. The major complaints at the time of presentation were earache (32.3%), nasal foreign body (24.0%) and aural foreign body (13.3%) closely followed by aero-digestive tract foreign body (12.0%). Inflammatory conditions affected the ears more, foreign bodies found most commonly in nose and miscellaneous condition such as impacted wax was found to be related to ear in significantly higher proportion. Conservative management was provided to 96.25% of patients. Foreign body insertion was found to be associated with lower age group. Most of the

emergencies were managed conservatively which might be done at subdivision or district level to reduce the undesirable burden on the tertiary care medical colleges.

Keywords Pediatric · Otolaryngological emergency · Presenting complaints · Conservative management

Introduction

Pediatric population covers a significant portion of total population in India as well as all over the world. As per Indian census report 2011, the percentage of 0–14 year population was 29.5% of the total [1]. In hospital emergencies the age distribution of the patients reflects the close picture. Otolaryngological conditions comprise a major part of emergency problem in children. Some of the problem may be simple and easy to manage whereas a few may be life threatening. Many of these conditions can be managed without hospital admission and can also be managed in peripheral health care facilities at subdivision or district level but few others required immediate referral to equipped centre. In different literature foreign body insertion (accidental or by self) was found to be the most common reason for attending otolaryngology emergency among the children as well as the adults [2]. Trauma in ear, nose or throat, acute inflammatory conditions like acute otitis media and epistaxis are the other conditions in the list. The present study was contemplated with the objectives to assess the age and sex distribution, to find out the mode of presentation and pattern of ENT morbidity as well as to describe their treatment modality among pediatric patients attending otolaryngology emergency facility of a tertiary care teaching hospital at Kolkata.

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Materials and Methods

A descriptive cross-sectional study was done by analysing retrospectively collected secondary data contained in the records of emergency department of otolaryngology in a tertiary care hospital, Kolkata. Study period was for 6 months, July 2016–December 2016. The children attended ENT emergencies up to the age of 14 years were included in the study irrespective of their presenting complaint(s). The information pertaining to sex, age, presenting complaint(s), and provisional diagnosis followed by modes of management were gathered from the records kept in the department. Permission was obtained from the authority for using the hospital records.

As it was a cross-sectional study involving simple proportion, the required sample size (N) would have been $N = Z^2pq/l^2$, where $Z = 1.96$ at 5% precision with 95% confidence limit, p = proportion of emergency attendance of children with otolaryngeal problem, $q = 100 - p$, l = allowable error which was considered to be 5 (absolute). Considering $p = 33.7\%$ [5], the figure was 343 and in the present study a round figure i.e. 400 patients were included after considering 15% non-response.

Collected data were analyzed using SPSS 22 version. Mean, standard deviation, median, proportions were calculated for describing the variables. Data display was done with the help of charts and tables. Statistical tests like independent 't' test, analysis of one way variance (ANOVA) test, χ^2 test, Odds ratio (OR) with its 95% confidence interval (CI), simple binary logistic regression were used for drawing inference about the relationship between the variables. P value of < 0.05 was considered statistically significant at 95% CI.

Results

Total 1025 patients attended the ENT emergency within the study period of which 400 i.e. (39.02%) were under the age of 14 year.

Analysis of data collected from 400 paediatric patients showed that 43.0% were male. Average age of the attendees was 58.95 ± 34.42 (mean $\pm$ SD) months, with median age of 48 months and range of 2–156 months, respectively.

Half of the patients presented with ear related problems whereas almost one-third with nose related (Table 1).

The major complaints at the time of presentation were earache (32.3%), nasal foreign body (24.0%) and aural foreign body (13.3%) closely followed by aero-digestive tract foreign body (12.0%) (Table 2).

Majority of diagnoses belonged to foreign body (47.5%) followed by inflammatory conditions (26.5%). However, earache (32.3%) was found to be single most important presenting complaint followed by foreign body in nose (24.0%) (Fig. 1). In a few patients, presented with history of foreign bodies, were found to have no foreign bodies actually.

Assuming the morbidity equally arising out of ear, nose and throat the observed distribution pattern was tested using χ^2 of goodness of fit test. It was revealed that inflammatory conditions were significantly more of aural origin, foreign bodies were of nasal origin, and miscellaneous conditions such as impacted wax were found to be related to ear in significantly higher proportion. (Table 3).

Conservative management was found to be on the top of the list received by 96.25% of the patients. (Table 4).

Based on the ANOVA test results regarding the age difference across different diagnoses two diagnostic categories were created as 'inflammatory and traumatic conditions' (categorized '0') [which included epistaxis] and 'others' (categorized '1') [majority of which were foreign body insertion] for further analysis which reflected that the patients presenting with former category had significantly

Table 1 Distribution of the patients as per their complaint(s) related to ear/nose/throat

Presenting complaints	No. of patients (percentage)
Related to ear	200 (50.0)
Related to nose	122 (30.5)
Related to throat	62 (15.5)
Others*	16 (4.0)
Total	400 (100)

* Others = mass over parotid region, injury in the region of face, swelling cheek, swelling on neck

Table 2 Distribution of patients as per their complaints at the time of presentation (N = 400)

Presenting complaints	Frequency	Percentage
Earache	129	32.3
Earache with discharge	10	2.5
Aural foreign body	53	13.3
Nasal foreign body	96	24.0
Upper aerodigestive tract foreign body	48	12.0
Epistaxis (without any history of trauma)	26	6.5
Ear bleeding (without any history of trauma)	8	2.0
Injury	8	2.0
Sore throat	14	3.5
Others	8	2.0
Total	400	100

Fig. 1 Distribution of patients based on diagnosis

Table 3 Distribution of study subjects as per their diagnosis (N = 400)

Disease group	Provisional diagnosis			$P(\chi^2 \text{ goodness of fit})^*$
	Related to ear no. (%)	Related to nose no. (%)	Related to throat/other no. (%)	
Inflammatory condition ($n_1 = 106$)	90 (84.91)	0	16 (15.09)	130.61, < 0.05
Foreign Body ($n_2 = 190$)	48 (25.26)	96 (50.53)	46 (24.21)	25.31, < 0.05
Trauma ($n_3 = 29$)	15 (51.72)	9 (31.03)	5 (17.24)	5.24, > 0.05
Miscellaneous ($n_4 = 75$)	46 (61.33)	24 (32.0)	5 (6.67)	33.68, < 0.05

*At degree of freedom 2

Table 4 Distribution of cases according to managements they received (N = 400)

Managements	Frequency	Percent
Conservative management and minor surgical repair without admission	385	96.25
Conservative management after admission	01	0.25
Surgical management after admission	10	2.50
Surgical management as day care approach	01	0.25
Referred for operative intervention in other specialty	03	0.75
Total	400	100.0

higher age than their counterpart. However, these groups were found to be comparable so far as the gender was concerned (Table 5).

After categorization of treatment in 'conservative management' and 'instrumental maneuver' it was revealed that the 'conservative management' was found to be

Table 5 Distribution of cases according to their diagnostic categories (N = 400)

Attributes	Diagnostic category		Statistics	P value
	Inflammation/trauma/epistaxis (n ₁ = 139)	Others (including foreign bodies) (n ₂ = 261)		
Age in month (mean ± SD)	72.95 ± 35.01	52.10 ± 32.23	t = 5.976*	0.000
Sex [no. (%)]			$\chi^2 = 0.870$, df = 1	0.916
Male	59 (14.75)	113 (28.25)		
Female	80 (20.0)	148 (37.0)		

*t = independent 't' test at df 398

significantly more among those who were included in 'inflammatory and traumatic conditions' of diagnostic category than their counterpart [$\chi^2 = 5.421$ at df 1, $P = 0.020$; OR 7.822 (1.018–60.120)].

Simple binary logistic regression analysis revealed that with significant model value the age was found to have significant negative association with otolaryngeal emergency 'other than inflammatory and traumatic condition'. (Table 6) With decrease in age by 0.02 month incidence of otolaryngeal emergency of 'other than inflammatory and traumatic condition' variety was found to increase by one. The P value as well as odds ratio (OR) [Exponential (Beta) or Exp(B)] with its 95% CI indicated that the lower age was protective for traumatic as well as inflammatory condition.

Discussion

In the present study about 39% of total emergency patient in ENT department were children under fourteen years of age. This was higher than the proportion of under fourteen children in general population as per the Govt. Census data [1]. Kumar and Gulati in 1999 found this proportion to be 33.7% which was much closer to the age distribution pattern in general population than the present study [3]. Signorelli and Mendes in their study found more than half of the total children attended hospital emergency were diagnosed to have one or other diagnosis related to otolaryngology [4]. In the present study the data of total pediatric

emergency attendance was not included so it couldn't be commented from this study whether the ENT emergency problems among the children were proportionately more or in general the emergency medical problems were more in pediatric age group. But this much could definitely be concluded that the otolaryngological emergency was one of the most important components in pediatric emergency. The present study found slight female preponderance unlike the observations in other studies [3].

Half of the patients in the present study were attended in ENT emergency with otological complaints and one-third with rhinological complaints. Saha et al. in their study among all age group of population found the throat related problems to be the highest in number among the ENT emergencies [5]. As revealed in the current study, earache was the most common presenting feature followed by nasal foreign body. As a whole, foreign body insertion topped the table with almost half of the patients. In the foreign body group nasal foreign body was on the top with half share of the group (96 of total 190 cases i.e. 50.53%). This observation was corroborative to the findings of some other studies [3, 6]. From the present as well as others studies it can be concluded that nose is the most common site of foreign bodies insertion/lodgement among children and the nasal foreign body is the most common diagnosed entity in the present study. As a broad group 'inflammatory condition' came second after the 'foreign body insertion'.

It is evident from the current study that majority of the patients can be managed in emergency department with 'conservative measures' or with 'some simple procedure'

Table 6 Simple logistic regression between age and diagnostic category (variables in the equation)

	B-test value	Standard error	Wald	Degree of freedom (df)	Significance	Exp(B)	95% C.I. for Exp(B)	
							Lower	Upper
Step 1 ^a								
Age	− 0.018	0.003	30.619	1	0.000	0.982	0.976	0.989
Constant	1.732	0.233	55.226	1	0.000	5.651		

^aVariable(s) entered on step 1: age, outcome variable-otolaryngological morbidity (grouped as category 0 and 1)

(i.e. foreign body removal without anesthesia). These two groups comprised 96.25% of total study participants. Admission required only for 2.75% children. One child was managed by day care procedure with short anesthesia without admission on next day (bilateral aural foreign body). Surgical interventions after admission were needed in only 2.5% cases (mainly for upper aero-digestive tract foreign body) and only one child was managed conservatively after admission without any surgical intervention (acute epiglottitis in a 11 year-old child). Kumar and Gulati in their study found 19% admission rate among the pediatric emergency cases which was much higher than the present study [3]. However, low admission rate (2.3%) like that of the present study was also reported from the study conducted by Al- Mazrou et al. [2]. But unlike the study carried out by Al- Mazrou et al. where one half of the admitted children needed surgical intervention and another half received conservative treatment, only one child did not required any surgical intervention after admission and managed conservatively.

Conclusion

From the present study and other available literature it is evident that the majority of the pediatric otolaryngological emergencies can be managed with conservative approach including simple procedure (removal of nasal or aural foreign body) may be done in Emergency service room and only a small proportion of the attendee with serious ailments requires more skilled care like emergency surgical intervention, continuous monitoring of progress after providing conservative management in the in-patient-

department. So, if the physicians working at the secondary level health care facilities are trained to increase their expertise in this emergency medical care undue referral to the higher level may be curbed to a great extent to reduce the prohibitive implication(s) like underutilization scarce resources in the tertiary care institutions meant for highly skilled care required by more complex problems as well as teaching and economical and emotional toll on the parents/care givers.

Compliance with Ethical Standards

Conflict of interest There is no conflict of interest among the authors.

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