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Original Article

Burden of ear morbidities among children in primary care setting in Delhi

Charu Kohli^{a,*}, Udhayabashkaran Kadirvelu^a, Suneela Garg^b,
Nandini Sharma^c

^a Resident, Department of Community Medicine, Maulana Azad Medical College, New Delhi, India

^b Director Professor and Head, Department of Community Medicine, Maulana Azad Medical College, New Delhi, India

^c Director Professor, Department of Community Medicine, Maulana Azad Medical College, New Delhi, India

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ABSTRACT

Introduction: Ear diseases in children are a major public health problem in developing countries. Among the risk factors of ear morbidities, socio-demographic factors play an important role.

Objective: To determine prevalence of ear morbidities and its socio-demographic determinants in children 1–10 years in an urban primary health center in Delhi.

Materials and methods: A cross-sectional study was conducted among 160 children aged 1–10 years in an urban primary health center situated in Delhi over a period of 3 months from January to March 2015. Primary caregivers (mother/father) of ill children aged 1–10 years who came to seek medical care for their children were interviewed using pre-tested, predesigned, semi-structured questionnaire schedule. Data was analyzed using SPSS software (version 17). Chi-square test was used to observe the differences between proportions. The results were considered statistically significant if “p” value was less than 0.05.

Results: The study was conducted among 160 children of which 87 (54.4%) were males and 73 (45.6%) were females. Majority of families were Hindu (90.6%) and nuclear (53.8%) residing in same community. 30 (18.8%) children reported with ear complaints to out-patient department. 50 (31.2%) caregivers reported history of ear complaints in the child. Most common complaints were foreign body (14.37%), hearing loss (11.24%) and ear discharge (5.62%). No association was seen with age, gender and education of caregivers.

Conclusion and recommendations: There is a need to take immediate measures for prevention and control of common ear diseases in children.

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1. Introduction

Ear diseases in children are a major public health problem in developing countries. If left unattended, it may result in

various social and psychological problems for affected children and their families.¹ Among all ear diseases, ear infections are a common but treatable cause of morbidity in children. Long-term consequences of persistent severe ear

* Corresponding author at: Department of Community Medicine, Maulana Azad Medical College, New Delhi 110002, India.

E-mail address: kohlicdoc17@gmail.com (C. Kohli).

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infection can arise in untreated cases like speech development disorders, poor academic and educational development and lower overall quality of life.^{2–4} Estimates say that around 42 million people have hearing loss worldwide. The major cause for hearing impairment is otitis media, which is second only to common cold as a cause of infection in childhood. Respiratory tract symptoms such as cough, sore throat, and earache are also frequently seen in children.^{5,6}

Hearing impairment and preventable ear diseases are important health problems among children in India as well with prevalence of ear diseases to be 11.3%.⁷ A number of studies have been conducted to find the risk factors of ear diseases in children. Increased knowledge of the risk factors associated with ear diseases is important in identifying children at risk for recurrent and persistent episodes.⁸ Among the risk factors of ear morbidities, socio-demographic factors play an important role. In a study conducted in Canada, various risk factors were studied for ear morbidities. It showed that the strongest risk factors for ear infection were being male, aboriginal status and mother age.⁹ Another study done in Australia revealed factors like poor living conditions, exposure to cigarette smoke and lack of access to medical care are all major risk factors for ear infections.¹⁰ The treatment itself of ear diseases in childhood is associated with significant morbidity and mortality due to surgery and also puts a significant financial burden on family and health care services.¹¹

Looking at the serious consequences of ear diseases among children, it is important to know the burden of the problem with its correlates. This will help in formulating interventions for prevention and control. Prevention of ear diseases is possible only if the risk factors are known. Socio-demographic determinants are also important to understand since they could be the major factors playing a crucial role in disease development. There is paucity of literature about the burden of ear morbidities in children and its determinants in Delhi. This paper presents results of a study conducted with objective to determine prevalence of ear morbidities and its socio-demographic determinants in children 1–10 years in an urban primary health center in Delhi.

2. Materials and methods

2.1. Study design, participants and sampling technique

This was a cross-sectional study conducted among 160 children aged 1–10 years in an urban primary health center situated in Delhi. The study was conducted over a period of 3 months from January to March 2015. In the study, primary caregivers (mother/father) of 160 ill children aged 1–10 years who came to seek medical care in out-patient department (OPD) for their children were interviewed. Sample size was calculated on the basis of previous study by Srivastava et al.⁷ in which prevalence of ear morbidities was 11.3%. Taking 95% confidence interval with 5% absolute error, sample size came out to be 156. A total of 160 subjects were included in the study. Study subjects fulfilling the inclusion criteria were selected by simple random sampling method.

2.2. Study tool

A pre-tested, semi-structured questionnaire schedule was prepared in local language consisting of items on demographic profile including age and sex of the child, religion, type of family, education and occupation of parents, etc. Questionnaire included items to assess common ear morbidities and ear care practices followed. Health seeking behavior about health system and health care provider preference were also asked. Questionnaire was pilot tested in a different setting for assessing its feasibility and reliability. Suitable modifications were done afterwards. Cronbach's alpha which is a coefficient of internal consistency was calculated which came out to be 0.82. Average time duration of each interview was approximately 5–10 min.

2.3. Inclusion and exclusion criteria

Caregivers of all patients aged 1–10 years coming out from the consultation rooms were included. Caregivers of seriously ill patients were excluded from the study.

2.4. Statistical analysis

Data was analyzed using SPSS software (version 17). Results were presented in simple proportions and means ($\pm$ SD). Chi-square test was used to observe any difference between proportions. The results were considered statistically significant if “p” value was less than 0.05.

2.5. Ethical issues

All caregivers were explained the purpose of the study and confidentiality was assured to them before taking interview. A written informed consent was taken from the participants before start of interview.

3. Results

3.1. Socio-demographic profile

The study was conducted among 160 children of which 87 (54.4%) were males and 73 (45.6%) were females. 48 (30%) children were less than 2 years of age, 66 (41.2%) were between 2 and 5 years of age and 46 (28.8%) were more than 5 years of age. Majority of families were Hindu (90.6%) and nuclear type (53.8%) residing in same community. Mother was literate of 135 (84.4%) children while father was literate of 146 (91.2%) children as shown in Table 1. Mean ($\pm$ SD) monthly family income was INR 7637.5 $\pm$ 1155.30.

3.2. Ear morbidities

30 (18.8%) children reported to OPD with ear complaints. 14 (46.7%) cases out of 30 belonged to age group of 2–5 years while 9 (30%) were more than 5 years of age. There was no statistically significant difference between age groups with respect to current ear complaints with $\chi^2 = 0.82$, df = 2, p value = 0.66. Out of 30 children who reported with current

Table 1 – Socio-demographic profile of study subjects.

Characteristic		N = 160	Percentage (%)
Gender of child	Male	87	54.4
	Female	73	45.6
Age (in years)	<2 years	48	30.0
	2–5 years	66	41.2
	More than 5 years	46	28.8
Religion	Hindu	145	90.6
	Muslim	15	9.4
Education of mother	Illiterate	25	15.6
	Literate	135	84.4
Education of Father	Illiterate	14	8.8
	Literate	146	91.2
Type of family	Nuclear	86	53.8
	Joint	74	46.2

Table 2 – Socio-demographic determinants of ear morbidities.

Characteristics	Current ear complaints		Chi-square, df, p value
	Present N = 30 (%)	Absent N = 130 (%)	
Age (in years)			0.82, 2, 0.66
<2 years	7 (23.3)	41 (31.5)	
2–5 years	14 (46.7)	52 (40)	
More than 5 years	9 (30)	37 (28.5)	
Gender			0.88, 1, 0.34
Male	14 (46.7)	73 (56.2)	
Female	16 (53.3)	57 (43.8)	
Religion			4.90, 1, 0.02
Hindu	24 (80.0)	121 (93.1)	
Others	6 (20.0)	9 (6.9)	
Education of mother			0.14, 1, 0.70
Illiterate	4 (13.3)	21 (16.2)	
Literate	26 (86.7)	109 (83.8)	
Education of father			0.20, 1, 0.65
Illiterate	2 (6.7)	12 (9.2)	
Literate	28 (93.3)	118 (90.8)	

ear complaints, 14 (46.7%) were males and 16 (53.3%) were females but this difference was not significant ($\chi^2 = 0.88$, $df = 1$, p value = 0.34). There was a significant association observed with religion where 24 (80%) were Hindu and 6 (20%) were non-Hindu with $\chi^2 = 4.90$, $df = 1$, p value = 0.02. There was no significant difference with education status of father or mother as shown in Table 2.

When data was analyzed to see any difference in school age group and non-school age group, it was found that 140 children were less than 5 years and 20 were more than 5 years of age. Among 140 children who were less than 5 years of age, 24 (17.1%) were having ear complaints and among 20 who were more than 5 years of age, 9 (45%) were having ear complaint. There was significant difference in two groups with p value = 0.001.

22 (73.3%) children out of 30 received measles vaccination while 8 (26.7%) did not received measles vaccine but this difference was not significant with $\chi^2 = 1.51$, $df = 1$,

Table 3 – Gender wise distribution of ear compliants in last 6 months in children.

Ear complaints	Gender		Chi-square, df, p value
	Male N = 87 (%)	Female N = 73 (%)	
Age (in years)			5.93, 2, 0.15
Ear discharge	4 (4.6)	4 (5.5)	
Foreign body	8 (9.2)	15 (20.5)	
Hearing loss	8 (9.2)	11 (15.0)	

p value = 0.21. No association was seen with type of family ($\chi^2 = 0.01$, $df = 1$, p value = 0.96) and mode of delivery, i.e. institutional or home delivery ($\chi^2 = 1.29$, $df = 1$, p value = 0.52).

Data was also collected for any history of ear complaints in last 6 months. 50 (31.2%) caregivers reported history of ear complaints in the child. Most common complaints were foreign body (14.37%), hearing loss (11.24%) and ear discharge (5.62%) as given in Table 3. No association as seen with gender ($p > 0.05$).

About the practices of ear cleaning, 39 (24.4%) caregivers reported that they do not clean the ear of the child while 121 (75.6%) reportedly used to clean the ear of the child. Most common method used for ear cleaning was cotton bud as reported by 67 (41.9%) of caregivers. 51 (31.9%) reported use of matchstick or pin with/without cotton while only 3 (1.9%) used to go to doctor for ear cleaning. Out of these 121 caregivers, mother used to clean the ear as reported by 107 (88.4%) caregivers. 90 (56.2%) caregivers reported that they used to put oil inside the ear of the child for cleaning purpose. The practice of cleaning of ear and putting oil was significantly associated with mother's education status. Among illiterate mothers, 12 (85.7%) used to put oil in ear while this figure was 78 (53.4%) among literate mothers ($\chi^2 = 5.41$, $df = 1$, p value = 0.02).

3.3. Health seeking

Data was collected regarding health seeking behavior regarding ear care. Majority 77 (48.1%) caregivers preferred allopathic providers for consultation for ear complaints. Home remedies like putting mustard oil in the ear, massage with herbs oil around the ear etc. were reported by 28 (17.5%) caregivers. Local unqualified healthcare providers were first preference of 20 (12.5%) caregivers for consultation. Some caregivers (16.3%) reported that they used to go directly to pharmacy shops for taking any ear drops if child develops any ear complaint. AYUSH (ayurveda, unani, siddha, homeopathy) practitioners/traditional healers were consulted by 5.6% caregivers as shown in Fig. 1. Government health care system was preferred by 122 (76.2%) of the caregivers while private system was preference by 38 (23.75%) caregivers.

4. Discussion

A cross-sectional study was conducted among 160 children aged 1–10 years presenting to OPD in an urban primary health center situated in Delhi. Data was collected from primary caregivers of children using semi-structured questionnaire to

Fig. 1 – Preference of healthcare providers for ear compliants as reported by caregivers.

assess burden of ear morbidities and their determinants. The prevalence of ear morbidities among children was 18.8%. This was consistent with the findings of another study conducted in Delhi by Chadha et al.¹² where 14.8% of study sample were diagnosed with one or more ear morbidities. Among the socio-demographic factors, only religion was significantly associated with ear morbidities. There was no significant association seen with age, gender of child and education status of parents. This is similar to findings of another study carried out by Shah et al.¹³ in which religion was significantly associated with ear diseases and no association was seen with education of mother and gender. Although some studies have shown significant association with age, gender, education of parents and income.¹⁴ The reason could be difference in the study population and study area. A significant proportion of children gave history of ear complaints in the past 6 months. Common complaints were foreign body, hearing loss and ear discharge. However recall bias can be a source of error. Similar findings were shown by another study where foreign bodies and ear infections were main complaints in children.¹²

Ear care practices play an important role in development and progression of disease in children. About three-fourth of caregivers reported cleaning of ears of children. Most common was use of cotton bud or match stick. Putting oil in ear was also a common practice. Similar practices like cleaning ears with sharps, putting neem or garlic with mustard oil or snake oil in the ear have been reported earlier also by other authors.^{15,16} These practices not only leads to injuries like perforation but also predispose to infections. Use of cotton tips applicators has been reported to be a leading cause of otitis externa in children by Nussinovitch et al.¹⁷ Kravitz et al.¹⁸ also reported use of cotton applicator as cause of injury in ear. Thus use of cotton tip applicator is always discouraged but is a very common practice among masses. Important finding was that these harmful practices were associated with maternal education which emphasizes crucial role of female literacy. About the health seeking practices, multiple health care providers were preferred by caregivers. Seeking consultation from pharmacy shops were important findings since it can lead to misdiagnosis and treatment. This may lead to complications later on. Home remedies were also reported as stated by other studies as well.¹⁹ To address the issue of ear morbidities, government

of India has launched National Program for Prevention and Control of Deafness which has core components of prevention, early diagnosis and treatment with rehabilitation of those who cannot be cured.

5. Conclusion and recommendations

There is a need to take immediate measures for prevention and control of common ear diseases in children. Ear care practices are associated with maternal education. Awareness campaigns about the common causes, complications and correct practices for ear care are recommended.

5.1. Strengths and limitations

This study presents important insight into the burden of ear morbidities in a primary health care setting and especially about the ear care practices followed. These findings can be used to plan future strategies for health education interventions about ear care in the community. However, small sample size, lesser representation of school going age group and only one study area chosen could be limitations.

Conflicts of interest

The authors have none to declare.

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