Ear diseases in children presenting at Nepal Medical College Teaching Hospital

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ABSTRACT

Ear diseases are a common presentation in the ENT out-patient department. These diseases can have sequelae if not treated early which may cause increased morbidity, hearing disability and even mortality. Identifying these conditions early and treating them can reduce these unwanted sequelae. A prospective study over a period of three years was undertaken in a tertiary care hospital in Kathmandu. All children presenting with ear diseases consecutively in the ENT out-patients were included and their data was recorded in a pro forma. The data was analysed for frequency and cross-tabulated. The study included 2218 children with ear diseases among which 868 (39.1%) were pre-school and 1350 (60.9%) were school going children. The male to female ratio was 1.5:1. The most common otological problem was wax impaction (40.2%), followed by acute otitis media (AOM) with 24.3%, chronic suppurative otitis media (CSOM) with 17.7% and acute otitis externa (AOE) with 7.5% of the total cases. The other conditions were otitis media with effusion (2.8%), foreign bodies in the ear (2.3%), otomycosis (1.7%), preauricular sinus (1.1%), sensorineural hearing loss (0.8%), trauma to the ear (0.7%), keloids (0.3%), microtia (0.2%) and perichondritis (0.2%).The three year olds had the highest number of otological diseases with 9.2% of the total among the ages studied. It is felt that proper education of health care providers regarding ear diseases and also awareness in the community can prevent and reduce the disability and complications of these conditions.

Keywords: Ear diseases, children, prevalence.

INTRODUCTION

Ear diseases make up a substantial amount of workload for the Ear, Nose and Throat (ENT) specialist. This also holds true in the paediatric age group where they account for about one third of the otorhinolaryngological outdoor attendances.[1] It has been seen that among them preventable ear diseases have been found to be an important health problem among children.[2] However, although there are a substantial number of preventable ear diseases in children, they might subsequently present in the tertiary setting as a sequelae to the underlying disease condition. This specially holds true to countries like ours where the numbers of trained specialists are few and most of them are concentrated in the cities. All doctors attending such patients in non-specialised hospitals or clinics may not have adequate knowledge or equipment to identify and deal with the various ear diseases. Compounding this problem is the fact that most of these children come from relatively poor socioeconomic backgrounds. This may lead to poor personal hygiene along with a lack of awareness about health related issues. In spite of this, asking a proper history with leading questions about the disorders of the sensory systems and the related structures is helpful in diagnosis.[3] Hence, adequate examination of the entire child with special attention to the head and neck, can lead to the identification of a condition that may predispose to or be associated with ear diseases.[4] Although this may lead to a diagnosis, the actual treatment may not be available in the local community. The patients may have to travel to the nearest health centres where adequate facilities are available for management of these conditions. However, the lack of financial resources may further hamper presentation to hospitals at the early onset of ear diseases. This leads to children presenting with life threatening complications of otitis media such as mastoid and intracranial abscesses as seen in other underdeveloped countries.[5] These facts further emphasise the need to identify ear diseases in children and to treat them promptly. This will not only help in preventing or curtailing the complications of these diseases but also reduce the financial burden on these patients and their families.

The aim of this study was to determine the prevalenceand distribution of ear diseases in children attending the Department of ENT and Head and Neck Surgery, at Nepal Medical College Teaching Hospital, Attarkhel, Kathmandu.

Table-1: Ear diseases in pre-school and school children

Ear Diseases	Age range		
	0-5 years	6-14 years	Total
Keloid	4 (0.2%)	2 (0.1%)	6 (0.3%)
Preauricular sinus	5 (0.2%)	19 (0.9%)	24 (1.1%)
Microtia	4 (0.2%)	1 (0.0%)	3 (0.2%)
Perichondritis	0 (0%)	4 (0.2%)	4 (0.2%)
Trauma external ear	8 (0.4%)	8 (0.4%)	16 (0.8%)
Foreign body ear	17 (0.8%)	34 (1.5%)	51 (2.3%)
Acute otitis externa (AOE)	11 (0.5%)	156 (7.0%)	167 (7.5%)
Otomycosis	8 (0.4%)	29 (1.3%)	37 (1.7%)
Wax	404 (18.2%)	488 (22.0%)	892 (40.2%)
Acute otitis media (AOM)	301 (13.6%)	237 (10.7%)	538 (24.3%)
Otitis media with effusion (OME)	12 (0.9%)	34 (2.5%)	46 (3.4%)
Complications of acute otitis media	0 (0%)	4 (0.2%)	4 (0.2%)
Chronic suppurative otitis media (TT)	88 (4.0%)	260 (11.7%)	348 (15.7%)
Chronic suppurative otitis media (AA)	6 (0.3%)	38 (1.7%)	44 (2.0%)
Complications of CSOM (AA)	0 (0%)	3 (0.1%)	3 (0.1%)
Sensorineural hearing loss (SNHL)	0 (0%)	17 (0.8%)	17 (0.8%)
Total	867 (39.1%)	1351 (60.9%)	2218 (100.0%)

MATERIALS AND METHODS

A prospective study was done in the Department of ENT and Head and Neck Surgery at Nepal Medical College Teaching Hospital. The study was conducted between November 2008 and October 2011. It included 2218 children from new born to 14 years of age who presented consecutively at the out-patient department with ear problems. These were all first time attendees and a careful history along with physical examination was done. Pure tone audiometry and tympanometry were done for patients needing audiological evaluation. The data along with the diagnosis was entered into a proforma after obtaining parental consent. The study was conducted to see the prevalence and distribution of ear diseases in pre-school (0-5 years) and school going (6-14 years) children along with the individual age groups involved. The data was analysed using SPSS 19 statistical software and descriptive studies were done to analyse the frequencies and percentages.

RESULTS

The study included 2218 children with ear diseases among which 868 (39.1%) were pre-school children and 1350 (60.9%) were school going children (Table 1). The age range of the children ranged from 1 month to 14 years of age, among which 1335 were males and 883 females. The male to female ratio was 1.5:1.

The most common otological problems recorded in our study was wax (cerumen) impaction 892 (40.2%) cases with pre-school 404 (18.2%) and school children 488 (22.0%). This was followed by acute otitis media (AOM) with 538 (24.3%) cases in which 301(13.6%) were preschool and 237 (10.7%) school children. Chronic suppurative otitis media (CSOM) was the third most common otological condition with 392 (17.7%) cases out of which 348 (15.7%) were mucosal or tubotympanic type and 44 (2.0%) were squamous or atticoantral type. Tubotympanic cases were seen in 88 (4.0%) and 260 (11.7%) in pre-school and school children respectively, similarly atticoantral disease were seen in 6 (0.3%) pre-school and 38 (1.7%) school children. Acute otitis externa (AOE) were frequently seen in school going children with 167 (7.5%) cases. The other otological presentations were otitis media with effusion (OME) in 62 (2.8%) cases, followed by foreign bodies in the ear in 51 (2.3%) children. Otomycosis was present in 37 (1.7%) children and congenital anomalies like preauricular sinuses were detected in 24 (1.1%) and microtia in 5 (0.2%) cases. Sensorineural hearing loss (SNHL) was recorded in 17 (0.8%) children. Trauma to the pinna and external auditory canal accounted for 16 (0.7%) patients and there were 6 (0.3%) keloids and 4 (0.2%) cases of perichondritis. The distribution of the mentioned ear diseases in the pre-school and school going children is shown in Table-1.

Complications of AOM and CSOM atticoantral were seen in 4 (0.2%) and 3 (0.1%) cases respectively. Out of the four complications of two cases were mastoiditis, one case was mastoid abscess and one was Luc's abscess. Complications of CSOM atticoantral included two cases of mastoid abscesses and onecase of brain abscess. These complications were found in the school going age group and none were seen in the pre-school children.

The 3 year olds had the highest rate of otological diseases with 205 (9.2%) cases. This was followed by the 4 year olds with 181 (8.2%) cases and the 5 and 12 year olds both with 180 (8.1%) cases. The least numbers of cases 118 (5.3%) were in the 13 years age group. Impacted

Table-2: Distribution of ear diseases in relation to age

Ear Diseases	Age in years														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
Keloid	0 0.0%	0 0.0%	4 0.2%	00.0%	0 0.0%	0 0.0%	00.0%	0 0.0%	0 0.0%	0 0.0%	1 0.0%	00.0%	0 0.0%	1 0.0%	6 0.3%
Preauricular sinus	1 0.0%	10.0%	00.0%	10.0%	10.0%	00.0%	10.0%	00.0%	00.0%	6 0.3%	3 0.1%	3 0.1%	0 0.0%	1 0.0%	24 1.1%
Microtia	1 0.0%	1 0.0%	0 0.0%	1 0.0%	1 0.0%	0 0.0%	1 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	5 0.2%
Perichondritis `	00.0%	00.0%	00.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	2 0.1%	1 0.0%	1 0.0%	4 0.2%
Trauma to EAC	0 0.0%	4 0.2%	2 0.1%	2 0.1%	0 0.0%	0 0.0%	1 0.0%	0 0.0%	1 0.0%	2 0.1%	0 0.0%	0 0.0%	2 0.1%	2 0.1%	16 0.7%
F B ear	0 0.0%	1 0.0%	2 0.1%	3 0.1%	11 0.5%	6 0.3%	9 0.4%	4 0.2%	2 0.1%	2 0.1%	1 0.0%	6 0.3%	2 0.1%	2 0.1%	51 2.3%
AOE	1 0.0%	0 0.0%	0 0.0%	3 0.1%	7 0.3%	19 0.9%	12 0.5%	21 0.9%	15 0.7%	29 1.3%	15 0.7%	16 0.7%	12 0.5%	17 0.8%	167 7.5%
Otomycosis	0 0.0%	2 0.1%	1 0.0%	0 0.0%	5 0.2%	2 0.1%	2 0.1%	6 0.3%	2 0.1%	6 0.3%	6 0.3%	0 0.0%	0 0.0%	5 0.2%	37 1.7%
Wax	53 2.4%	80 3.6%	107 4.8%	88 4.0%	76 3.4%	81 3.7%	81 3.7%	57 2.6%	41 1.8%	48 2.2%	51 2.3%	53 2.4%	34 1.5%	42 1.9%	892 40.2%
AOM	78 3.5%	55 2.5%	66 3.0%	62 2.8%	40 1.8%	35 1.6%	25 1.1%	27 1.2%	23 1.0%	12 0.5%	20 0.9%	48 2.2%	28 1.3%	19 0.9%	538 24.3%
CSOM TT	13 0.6%	12 0.5%	20 0.9%	15 0.7%	28 1.3%	22 1.0%	20 0.9%	18 0.8%	28 1.3%	30 1.4%	30 1.4%	43 1.9%	22 1.0%	47 2.1%	348 15.7%
CSOM AA	0 0.0%	0 0.0%	0 0.0%	4 0.2%	2 0.1%	0 0.0%	4 0.2%	2 0.1%	6 0.3%	2 0.1%	5 0.2%	3 0.1%	7 0.3%	9 0.4%	44 2.0%
OME	0 0.0%	0 0.0%	3 0.1%	1 0.0%	8 0.4%	9 0.4%	4 0.2%	3 0.1%	0 0.0%	4 0.2%	9 0.4%	3 0.1%	7 0.3%	11 0.5%	62 2.8%
SNHL	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 00.0%	3 0.1%	1 0.0%	3 0.1%	0 0.0%	3 0.1%	0 0.0%	7 0.3%	17 0.8%
Complications of AOM	0	0	0	0	0	0	0	0	1	1	1	0	1	0	4
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Complications of CSOM AA	0	0	0	0	0	0	0	1	0	0	0	0	2	0	3
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Total	147 6.6%	155 7.0%	205 9.2%	181 8.2%	180 8.1%	174 7.8%	160 7.2%	145 6.5%	122 5.5%	145 6.5%	142 6.4%	180 8.1%	118 5.3%	164 7.4%	2218 100%

wax cases were the highest in three year olds with 107 (4.8%) cases; whereas AOM was highest in children below one year of age i.e. 78 (3.5%) cases. CSOM tubotympanic was found to be highest in 14 year olds with 47 (2.1%) cases and the ten year olds had the highest rate of AOE with 29 (1.3%) cases. OME was highest in the 14 year olds with 11 (0.5%), similarly foreign bodies in the ears were most often seen in the 5 year olds with 11 (0.5%) cases. CSOM atticoantral was highest in the 14 year olds with 9 (0.4%) cases. Otomycosis was mostly seen in the 10 and 11 year olds with 6 (0.3%) cases each. SNHL accounted for 7 (0.3%) cases in the 14 year old age group which was the highest in the age ranges. Trauma to the external ear was seen the most in the two year olds with 4 (0.2%) cases. Preauricular sinuses were most prevalent in the 10 year olds with 6 (0.3%) cases, and keloids were seen most often in the 3 year olds with 4 (0.2%) cases. However, perichondritis were seen to be commoner in the 12 years old age group with 2 (0.1%) cases. The described ear diseases in relation to age are shown in Table-2.

DISCUSSION

Ear diseases are common health concerns in children in the developing countries. Otological diseases if not treated on time may lead to hearing impairment. Our study shows high incidence of ear diseases related to middle and external ear.

Preschool children aged 3, 4 and 5 years showed the highest number of ear diseases. The probable reason for this could be that they start to attend nurseries where the chances of cross infection are higher than the home environment.

In our study impacted wax (40.2%) obstructing the tympanic membrane was found to be the most otological problem in children. Studies conducted by Adhikari*et al.* and Sharma *et al.*also showed a high prevalence rate of impacted wax of 60%and 50% respectively in school going children.[6, 7] However other studies reported impacted wax ranging from 8.6% to 28.2%.[8-11]

Acute otitis media was the second most frequent presentation (24.3%) which predominantly was seen in children less than five years in our study. The highest prevalence was seen in children below 1 year of age and decreased with increasing age. This progression was also reported by Strangerup and Tos, and Akinpelu also observed a similar pattern of distribution of the disease.[3, 12] The probable cause may be the delayed treatment of upper respiratory tract infections in our country, where most parents tend to wait for such conditions to resolve spontaneously. The other contributing factors could be poor socioeconomic conditions, overcrowding, lack of health education and health facilities.

CSOM accounted for 17.7% and was found to be the third most common ear disease. Mucosal or tubotympanic disease was seen in 15.7% and squamous or atticoantral disease in 2.0%. It was seen that children with tympanic membrane perforation was higher in school going age group, with the maximum cases in the 14 year old age group. This could be due to the fact that these children might have difficulty in school so they seek medical help. Chronic suppurative otitis media is a major health problem in developing countries including Nepal.[13] In developing countries there is a differential prevalence of CSOM among the different socio-economic strata of the community and it varies from 1.3 to 17.6% whereas the prevalence of CSOM is less than 1% in the USA and UK.[14] Again this is probably due to the conditions of living in under developed countries, and we can show a similar trend in our study because most of the patients attending the hospital are from a rural community.

Acute otitis externa also seems to be a common presentation of ear diseases. In our study it was seen that this accounted for 7.5% of the total cases. Ten year old followed by 6 year old children were mostly found to be affected. Various factors could be responsible for this inflammation of the external auditory meatal skin.Predisposing factors may be genetically influenced, i.e. narrow canal, excessive wax or an inherited tendency to eczema; environmentally induced by heat, humidity and swimming; traumatic and self-induced through matchsticks and hairgrips etc. or infection.[15] In our context trauma is generally self-induced or done by the parents while cleaning the ears. However, exposure to water (swimming), impacted wax and the high heat and humidity prevalent in our country could further lead to this condition.

The number of children presenting with otitis media with effusion is 2.8% which is lower than published literature. This condition was found to be more in the school going age group as has been documented earlier in the results. However, a similar study done previously in Nepal showed otitis media with effusion to be 3.7%, and in Nigeria to be 5.3% of children.[3, 7] The prevalence of otitis media with effusion is rather variable, ranging from 1.3% to 31.3%, depending on the methods used, population characteristics like race, countries and environmental factors.[16-18] It is interesting to note that in spite of high numbers of cases of acute otitis media, the cases of otitis media with effusion are relatively low. This could be due to the fact that once the patient felt that the condition of acute otitis media had resolved he or she did not come for further follow-up. On top of this it is also not regular practice to do a tympanometry study on these patients, hence increasing the chances of missing otitis media with effusion. In some cases where tympanometry was advised parents were unable to do the test owing to their low financial status.

Foreign body in the ear accounted for 2.3% of all the cases and the highest was seen in the 5 year olds followed by the 7 yearold age group. The most common foreign bodies were seeds, beads, stones, pencil erasers and cotton buds. A study done in Nigeria showed foreign body in the ear canal as the 5thmost common ear disease which was 5.3%, whereas a study done in Kathmandu in school going children showed only 0.4%.[3,7] Children with foreign bodies which can be taken out easily may sometimes present with complications like laceration of the meatus and perforation of the tympanic membrane due to attempted manipulation of the foreign body.

Complications of AOM (0.2%) and CSOMatticoantral (0.2%) were also observedin our study.Acute mastoiditiswas the common complication seen in casesof

AOM, and mastoid abscesses in CSOM atticoantral.This is similar to other studies which show that acute mastoiditis is a common complication of AOM.[19,20] The advent of antibiotics has greatly reduced these complications, and the awareness of general practitioners has helped in the treatment. However, the threat of serious complications still remains which can still lead to significant morbidity and mortality.

Otomycosis, congenital anomalies like preauricular sinus and microtia, sensorineural hearing loss, trauma to the external ear,keloids and perichondritis were the other ear diseases seen. Prevalence of ear diseases was seen to behigher in the school going age group.

This study has helped us to identify the trend of otological diseases in children within the catchment area of the hospital. We also identified the vulnerable age groups which could get certain otological conditions. However, since the study was carried out in a tertiary centre which only catered to a certain faction of the population within the Kathmandu valley, it may not reflect the true prevalence of ear diseases in the community. For this similar studies need to be carried out at multiple health centres, and also screening should be done at the community level.Creating awareness in the community regarding ear diseases andeducating health service providers could help in early identification of the diseases. Hence, early referral to the specialists can prevent the sequelae and hearing impairment.

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