Impact of Lifestyle Factors on Chronic Otitis Media in Children Living in Slum areas

ABSTRACT

Background: Chronic Otitis Media (COM) is a common community health disorder of childhood in all developing countries. An undiagnosed hearing problem in childhood is a significant issue and can result in delayed language development, behavioral problems, and lifelong hearing disability. **Objective:** The study aimed to identify the prevalence of COM in children residing in slums and its association with the lifestyle and hygiene beliefs of slum areas.

Methods: The study enrolled 271 slum children from two slums of Delhi, aged between four to fifteen years. The entire study population underwent routine otoscopic examination followed by data collection on socio-demographic variables collected using a questionnaire.

Results: Out of the study population, COM and otitis media effusion(OME) accounted for 29 (10.8%) cases and 33 (12.3%) cases, respectively. The COM prevalence was higher among boys (19) than girls (10). The current study correlating COM with specific socio-demographic factors found a significant association between maternal education ($p<0.05$) and the disease. Also, ear cleaning habits ($P<0.001$), housing conditions, yearly income, family size, and medical consultation had a significant statistical association with COM ($p<0.05$).

Conclusion: The study highlight the lower prevalence of COM , this can be attributed to gradual improvement of slums community, socio-demographic conditions and increase in general awareness. But still there is a need of more campaigns and awareness-based programs in slums to stop the development of COM at the earliest stage among underprivileged children.

Keywords: chronic otitis media, hearing loss, slums children.

INTRODUCTION:

Hearing Impairment is the second most common problem in the world. The 2011 Indian Census noted that 2.21% of the Indian population suffers from hearing loss. In 1997, WHO reported a 6.3% prevalence of hearing loss in India (WHO, 2004). It increased from 76.5 million in 2008 to 100 million in 2018. Childhood hearing impairment, even when mild, may have a detrimental effect on linguistic and educational development, resulting in social and psychological problems for affected children and their families (Flexer et al.,1994). A high prevalence of mild hearing loss affects children's academic performance (Khairi et al., 2009). Childhood-onset hearing loss significantly affects lifelong disability and Quality of Life (QoL) (Graydon et al.,2019). In children, the prevalence of hearing loss was 6.6% to 16.47%, of which chronic suppurative otitis media (COM) and secretory otitis media/otitis media with effusion (OME) were the most common pathologies (Verma et al., 2022). COM It is characterized by a permanent perforation in the tympanic membrane with or without discharge from the middle ear, and OME is fluid inside the middle ear due to cough and cold. The prevalence of COM can range from 1.3 to 17 %.(Kacker et al., 2001) & (Datta et al., 2001). Children in rural areas have a high prevalence (11.9%) of hearing loss (Jacob et al.,1997) &(Rao et al., 2002). Literature from developing nations suggests the majority of affected individuals belong to low-income slum areas as compared to individuals belonging to high-income groups. Poor socio-economic conditions like overcrowding, unsafe sanitation, inadequate housing, malnutrition, and lack of primary healthcare are prevalent among these groups. (Chadha et al., 2014) .children are more prone to develop chronic otitis media due to recurrent upper respiratory tract infections, incomplete resolution, and acute suppurative otitis media treatment. (Berman et al. ,1995). The variations in socioeconomic status, lifestyles, living standards, and education across India also make it difficult to understand the extent of the problem and find a standard solution. (Verma et al.,2022). This study highlights these lifestyle factors significantly developing COM in young children.

OBJECTIVE:

1. To determine the prevalence of COM in respondents.
2. To determine the impact of socio-demographic profile on the development of chronic otitis media on respondents.

METHODOLOGY:

Type of Study: Quantitative and Cross – sectional study.

Study Area: The Study was conducted from two zones of Delhi slum areas of Paharganj and Sangam vihar because of their dense population. All the children who were present were included in the study.

Study Period: Data was collected from November 2018 to December 2018 (i.e., two months).

Study Population: A total of 271 children aged 4 to 15 years were included in the study for a Duration of 2 months

Tools & Technique

1. The entire study sample underwent clinical examination by Otoscopy. A perforated eardrum with or without discharge was kept as a diagnostic criterion for COM.

2. Parents (Father/Mother/Guardian) were interviewed regarding their lifestyle, socio-demographic profile (Income, Housing, Total family members, Sanitation, Maternal education), and health practices (Bathing pattern, Ear cleaning habits, Previous treatment-seeking methods). The interviewing physicians filled up the questionnaire.

Data Analysis:

All the collected data were coded and analyzed by SPSS Version 21.

The categorical variables related to demographic profile were presented using frequency and percentage. A statistical test such as the chi-square test was applied.

Inclusion criteria:

1. All those diagnosed with auditory problems by birth.
2. Students with ages from 4 to 15 years.

RESULTS:

The present study aimed to investigate the prevalence of COM (middle ear pathology) in slum children and to establish a correlation between COM and socio-demographic profile. Children were enrolled from two slum areas of Delhi. An otoscopic examination was done to check for middle ear status. A self-prepared questionnaire was used to interview the respondents which included case history and details about their socio-demographic conditions.

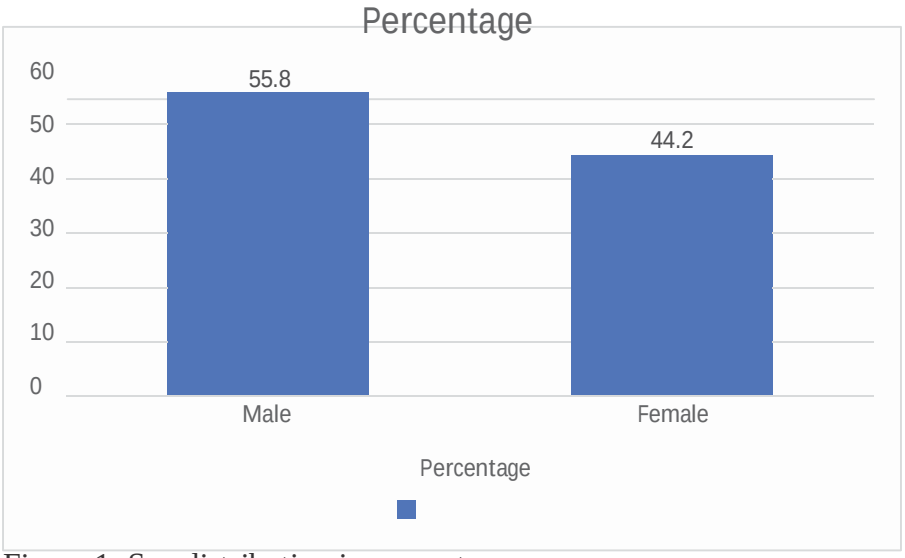

Figure 1: Sex distribution in percentage.

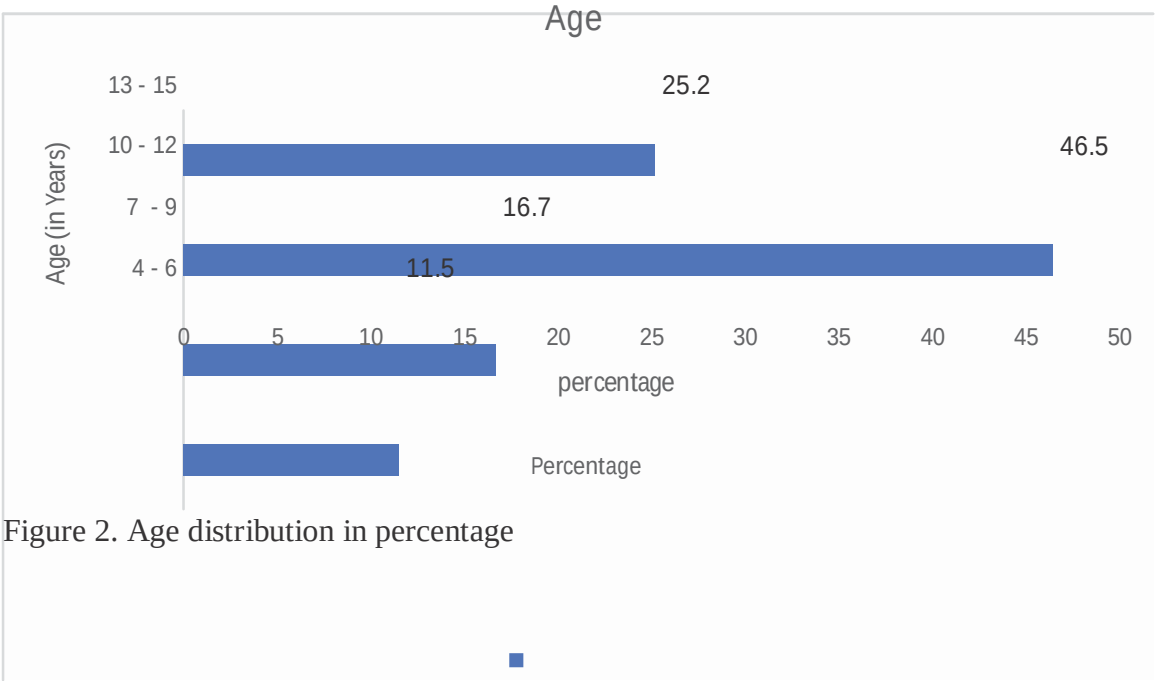

Figure 2. Age distribution in percentage

A total of 269 children were randomly selected from two slum areas of Delhi with male to female ratio of 1.124 (150 male and 119 female) participated in the study, with ages ranging from 4 to 15 years of different slum areas of Delhi, as shown in figure 1 & 2.

The prevalence of COM was 10.7% of these children. COM was more prevalent among boys 19 (7.06%) than girls 10 (3.7%).

Table 1: COM and Socio-demographic profile status of the children: (n=269)

Socio-economic Variables	Groups (% count within the group)		Total (%)	X2	P value
	Non CSOM	CSOM			
Yearly income of guardian					
<1 to 1.5 lacks	167 (86.52%)	26 (13.47%)	193 (69.51%)	7.75	0.005
> 1.5 lacks	73 (96.05.%)	3 (3.94%)	76 (28.25%)		
X2 value =7.75	df=1		P value <0.05		Significant
Family size					
Joint Family	159(90.7%)	25 (9.23%)	184 (68.4%%)	7.75	0.0053
Nuclear Family	80 (95.23%)	4 (4.76%)	84 (31.22%)		
X2 value =7.75	df=1		P < 0.05		Significant
Maternal Education					
Illiterate	177 (88.05%)	24 (11.94%)	201(74.72%)	1.5207	0.034

Educated	63 (92.64%)	5 (7.35%)	68 (25.27%)		
X2 value = 1.5207	df=1		P < 0.05		Significant
Rented/ Own house					
Kaccha	174 (75.38%)	21 (10.76%)	195 (72.49%)	7.8	0.006
Pakka	66 (89.18%)	8 (10.81%)	74 (27.50%)		
X2 value =7.78	df=1		P < 0.05		Significant
Guardian's\ Occupation					
	199 (88.05%)	27 (11.94%)	226 (82.8%)	5.8	0.015
Daily laborer					
Service/ small Business	41 (95.34%)	2 (4.65%)	43 (17.10%)		
X2 value =5.80	df=1		P < 0.05		Significant
Total	240 (89.21%)	29 (10.78%)	269 (100%)		
T-5690	df= 268	P value < 0.05			

Table 1 shows that the study population was from different families and socio-demographic profile. The everyday occupation of the guardians was daily laborers (82.8%), followed by service and small businessmen (17.1%). COM was more among the children of daily laborers (11.9% within the group), showing a statistically significant (P= 0.015) association with the CSOM group. The total number of family members was found from 4 to 10 persons. Most of the children were from joint families (68.4%), and COM cases were also more (9.23%) in that group; statistically, their association was significant (P=0.0053). The range of the yearly income of the guardians was 72,000 to 3,50,0000 rupees. Maximum children (69.5%) were from lower-income families (1.5 lakhs/year),

and a total of 26 children (13.4%) in the group of COM were from lower income. These income groups had a significant statistical association (P= 0.005) with the prevalence of COM. The level of maternal education plays a crucial role in family health. 74.7% of the children had illiterate maternal education. It has been shown that COM was more prevalent (11.9%) among the children of illiterate mothers than the literate ones. The relationship between maternal education and the prevalence of COM was found to be statistically significant (P= 0.034). Most of the children lived in a kaccha house (72.4%) than a pakka house, but the prevalence of COM was the same in both groups pakka house (10.8%) and kaccha house (10.7%).

Table 2 : COM and health practices of children: (n= 269)

Variables	Groups (% count within group)		Total (%)	X2	P value	
	No COM(%)		COM (%)			
Sanitation						
In house washroom	197 (88.34%)		26 (11.65%)	223 (82.89%)	2.79	0.09
Public washroom	43 (93.47%)		3 (6.52%)	46 (17.10%)		
X2 value =2.79	df=1		P < 0.05		Non Significant	
Bathing Habit						
River/canal/Pond	85 (88.54%)		11 (11.45%)	96 (35.68%)	0.003	0.95
Tube well and supply water	155 (89.59%)		18 (10.40%)	173 (64.31%)		
X2 value =0.003	df=1		P <0.05		Non Significant	
Ear Cleaning habit						
No ear cleaning	101 (95.28%)		5 (4.71%)	106 (39.40%)	12.44	0.0004

Regular/ habitual ear cleaning with cotton or bud or wooden stick	139 (85.27%)	24 (14.72%)	163 (60.59%)		
X2 value =12.24	df=1		P < 0.001	Significant	
Pattern of primary medical consultation					
Home remedies/Quacks	127 (84.10%)	26 (15.89%)	151 (71.3%)	13.54	0.001
homeopathy	41 (793.18%)	2 (6.81%)	44 (17.4%)		
Physician/ENT specialist	72 (97.29%)	1 (2..70%)	74 (11.50%)		
X2 value =13.54	df=1		P < 0.05	Significant	
Total	240 (89.2%)	29 (10.8%)	269 (100%)		

Table 2, shows that most of the study population used safe sanitation (in house wash-room or closed slab, 82.8%) and bathed in clean tube well water (64.3%). Only a few percent of children used public washrooms (17.1%). However, no statistically significant association was found between the prevalence of COM and sanitation & bathing habit. Furthermore, a statistically significant association was found between ear-cleaning practices and the prevalence of COM (P= 0.0004). 14.7% have an ear-cleaning habit with pins, feathers, and matchsticks. 4.7% have no ear-cleaning patterns. A maximum of the children (71.3%) sought primary medical treatment from quacks or home remedies, only a few children (11.5%) went to qualified doctors, and 17.4% from other practitioners. A significant statistical association (P= 0.001) was found between medical check-ups and the prevalence of COM.

DISCUSSION

In the current cross-sectional study among 269 slum children, 29 cases of COM were detected, and the prevalence was 10.7%. COM was more prevalent among boys 19 (7.06%) than girls 10 (3.7%). This result is consistent with studies done in neighboring developing nations like Bangladesh 5.2% (Shaheen et al., 2012), Dhaka 7.3% (Kamal et al., 2004), Nepal 5.0% (Adhikari et al., 2009), Tamil Nadu 6% (Rupa et al., 1999). However, the present study showed a lower prevalence than Verma (1995), who evaluated 613 children in a Haryana village. They had a much higher prevalence of COM (15.3%). The lower prevalence of COM in the current study can be attributed to the gradual improvement of the slum community's socio-economic conditions and increased general awareness concerning sanitation.

In the present study, 69.5% of the samples were from low-income groups (less than 1.5 lakh), among which 13.4% of the population had COM. The yearly income of the guardians had a significant association with the prevalence of COM (P = 0.005). This study's findings simulate such studies done in our country and abroad (Mann et al.,1998), (Kamal et al., 2004) & (Shaheen et al., 2012).

COM was more prevalent among the students belonging to joint families (9.2%). Overcrowding is a recognized risk factor for COM, and in the current study, the size of the family had a significant impact on the occurrence of COM (P = 0.0053). The findings were similar to a study done by **Shaheen et al.,(2012)** 87.8% of respondents were from medium-sized families.

Regarding the maternal education of the subjects, 74.7% of their mothers were illiterate, and only 25.2% were educated mothers. It was shown that COM was more prevalent (11.9%) among the children of illiterate mothers. The relation between maternal education and the prevalence of COM was statistically significant (P = 0.05). The findings are similar to the study done by **Shaheen et.al:(2012)** in Bangladesh among slum children, with a significant association between COM (7.4%) and illiterate mothers. In India, similar findings were obtained by **Rao et al.; (2002)**. The emphasis on maternal education is due to its impact on the hygiene habits of family members and consciousness regarding health care and nutrition.

Most of our study population lived in kaccha houses (72.4%). COM was also found more among the Kachha house dwellers (21 children out of 29 COM children). Similar results were found by **Shaheen et al. (2012)** in which (76.6%) of COM used the kaccha house **(Rao et al., 2002)**. They have found a significant relationship between the two. Poor ventilation, humid conditions, and neglected hygiene contribute to recurrent upper respiratory tract infections and, consequently, to

COM. In a recent study regarding COM, housing also revealed a significant association with the prevalence of COM between rural and urban residents **(Mann et al., 1998)**. WHO 1996 reports also stress adequate housing to prevent recurrent infections.

Most children (82.8%) used safe sanitation (closed slab, isolated sanitary latrine). Only a small number (11.6%) of students used unsafe sanitation systems (open or trench toilets). Safe sanitation habits are essential for the prevention of infections and overall well-being. However, the current research study's relationship between COM and sanitation habits was not statistically significant. These findings mimic the survey by **Shaheen et al. (2014)**

Among the children, 39.4% had no ear-cleaning habit. Those who cleaned their ears frequently (60.5%) used cotton buds, sticks, feathers, and pins. These habits proved to have a statistically significant effect on the current study's occurrence of COM (P = 0.0004). Biswas and Shaheen got similar results for ear cleaning habits **(Biswas et al., 2005) & Shaheen et al., 2012).**

Most children (71.3%) seek their primary medical treatment from quacks (ear cleaning from non-professionals, home remedies like putting oils inside the ears, and medicine from nearby medicine shops) of their locality. Only a few numbers (11.5%) attended the qualified doctors (MBBS & specialist). The prevalence of COM had a statistically significant relationship with the medical consultation-seeking practice between qualified doctors (MBBS and above) and non-qualified medical practitioners (P=0.001). Similar results were found by **(Shaheen et al.;2012)** in which 84.7% sought medical treatment from quacks, and only 12.3% went to Specialists. Biswas et al., 2005 found a similar result maximum of 35.71% goes to quacks Treatment from unqualified practitioners can result in incomplete and inappropriate treatment **(Siddique et al., 1995).**

In the current study, 162 (60.2%) students had no detectable ear problems on otoscopic examination. Ear wax (15.6%) and otitis media with effusion (OME) (12.3%) were the other commoner forms of ear disorder detected among those children. This result is consistent with other studies done in rural areas of developing countries. **Shaheen et al.; (2012)** found similar results in Bangladesh

Conclusion:

The current found the prevalence of COM (10.7%) in males (55.8%) and females (44.2%) in 4 to 15 years of slum children. The results of this study reflect a decreasing status of COM in slum children of Delhi. The low prevalence can be due to awareness program's running in slum

areas. Since socio-demographic variables are still prevalent in India(Davey et al., 2018, there is a need to strengthen the existing national program for the prevention and control of deafness and ensure its reach to the marginalized sections of society).

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