



SILENT MONSTER IN THE EAR: UNDERSTANDING THE LEVEL OF AWARENESS ABOUT CHOLESTEATOMA IN HOSPITAL VISITORS

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ABSTRACT

Background: Due to lack of severe symptoms and signs in initial stages and lack of awareness about the disease, there is a potential risk of uncomplicated cholesteatoma cases going unnoticed. This study aims to assess the level of knowledge about COM, especially cholesteatoma and related harmful practices among general population.

Methods: All consenting adult hospital visitors, irrespective of their purpose of visit were invited to participate in this questionnaire based, cross sectional study at the preregistration point of the tertiary care teaching hospital. Data was collected and analyzed using appropriate methods. The questionnaire contained 7 categories of various questions related to ear infections, especially Cholesteatoma.

Results: Among 350 respondents, majority exhibited poor level of knowledge about general perceptions about ear infections [295(84.3%)], perceptions about cholesteatoma [246(70.3%)]; awareness about intratemporal complications [244(69.7%)]; awareness about intracranial complications[247(70.6%)] and harmful practices in ear disease patients [279(79.7%)]. Multivariate analysis of socio-demographic and ear disease history related characteristics with overall ear disease related knowledge has shown that unskilled workers and unemployed respondents have poor knowledge levels compared to their counterparts, but at the same time the study has found that respondents with higher level of education also exhibited poor levels of knowledge in contrary to the existing evidence.

Conclusion: This study highlights the lack of awareness about COM, especially cholesteatoma and its potential complications, harmful practices mainly in rural population, even in well educated

groups, and the need for health education measures to create awareness among the general population regarding various areas of concern, to prevent a potential increase in the incidence of complications and deafness.

Keywords: Cholesteatoma; Chronic Otitis media; Knowledge; awareness; intratemporal complications; intracranial complications.

INTRODUCTION

Chronic Otitis Media (COM) is a long-standing inflammatory condition of the middle ear cleft with or without tympanic membrane perforation. It is one of the most common diseases encountered in clinical practice. The prevalence of COM in India is 7.8%, thus belonging to countries with the highest prevalence (>4%).^[1]

COM is mainly classified into tubotympanic type and atticofacial type, the latter having a propensity to develop cholesteatoma. Cholesteatoma is a serious ear disease, defined as a mass formed by the keratinizing squamous epithelium in the tympanic cavity and/or mastoid and subepithelial connective tissue and by the progressive accumulation of keratin debris with/without a surrounding inflammatory reaction.^[2] Atticofacial type of COM with Cholesteatoma has more chances of developing complications that can impair the quality of life or can be life-threatening.^[3] It commonly presents as scanty, foul smelling ear discharge or mild hearing loss, often diagnosed incidentally by the ENT surgeons, unlike Tubotympanic type of COM, which commonly presents with profuse, sticky, non foul smelling, non blood stained ear discharge. It is common in clinical practice to encounter most of patients with the COM, Atticofacial type who have not noticed any symptoms even in advanced stages.

There is only a minimal role of medical treatment in cholesteatoma. Once a cholesteatoma is found, surgical treatment is the only choice.^[4] Advising surgery to an asymptomatic patient or with minimal complaints could be quite challenging for the surgeon and could be upsetting to the patient and caregivers.

COM complications, despite its reduced incidence still poses a great challenge in developing countries, as the disease commonly presents in the advanced stage leading to difficulty in management and consequently higher morbidity.^[5] With limited routine consultations, subtle or no symptoms and signs added with a lack of awareness about cholesteatoma and its potential complications can result in delayed diagnosis and treatment. Thus attention is needed to increase awareness among general population about this potentially serious condition.

With our extensive literature review, very few studies have been done to assess the level of awareness among general population, mainly focusing on Cholesteatoma. Hence, this study was undertaken to assess the current level of awareness about COM, especially cholesteatoma and its complications, various harmful practices considered safe by the general population. This may hugely help in taking steps to create awareness among the public regarding the condition and the areas of ear health education to concentrate on and to stress the need to seek medical advice, thus reducing the chances of complications.

MATERIALS AND METHODS

A hospital-based cross-sectional study was conducted by the Department of Otorhinolaryngology of a tertiary care teaching hospital in India. All the consenting hospital visitors (patients and bystanders), irrespective of their purpose of visit, above 18 years of age, of any gender, approaching the screening area of the hospital and were included in the study. Doctors and health care workers, patients with emergencies were excluded. The study was conducted for a duration of 2 months. Data from 350 respondents was collected using a pre-designed, pre-tested questionnaire. The questionnaire contained questions on sociodemographic details like age, gender, education, occupation, presence or absence of ear complaints, past history of ear surgeries, family history of ear surgeries, in the local language. The questions on knowledge about various aspects of COM, especially cholesteatoma were compiled into 7 broad categories of meaningful and feasible

knowledge domains as follows:

Cat.1-General perceptions about ear infections, Cat.2- Perceptions about Cholesteatoma, Cat.3-Knowledge about common ear symptoms, Cat.4-Knowledge about Less commonly reported symptoms, Cat.5-Awareness about locoregional/Intratemporal complications. Cat.6-Awareness about General body complaints/Intracranial complications. Cat.7-Harmful practices considered safe by respondents in COM patients.

The collected data by interviewers was entered digitally using EpiInfo7 (version-7.2.2.6) software package. The analysis was done using SPSS version 24.0 analytical software.

RESULTS

Out of 350 total respondents, 191(54.6%) were males and 159(45.5%) were females; 228(65.1%) belonged to rural areas, whereas 12(34.9%) belonged to urban areas;173(49.4%) were unemployed and 177(50.6%) were employed. Majority of the study participants were Hindus 311(88.9%), whereas 21(6%) were Muslims,18(5.1%) were Christians. Significantly large portion of the respondents belonged to Class 2 i.e. 112(32%) and Class 3 i.e.138(39.4%) of B.G. Prasad Socioeconomic Classification. (Figure I &II)

Regarding education, more respondents were better educated i.e. with high school education 88 (25.1%), graduation/diploma 84(24%), higher secondary 65(18.6%) and middle school 59(16.9%)] than those who were less or not educated (Figure III).

Among 176 employed respondents, majority were coming under the categories of Skilled Labourers 58(32.9%), Professionals 35(19.9%), and Shop/business owners 13(7.5%).(Figure IV).

The majority of the respondents i.e.311(88.9%) did not have any ear problems. Family members of 339(96.9%) respondents did not have any history of ear surgeries. Past history of any ear surgery was not present in 337(96.3%) respondents.

Category 1: General perception about ear infection (Table 1)

Among 350 respondents, relationship of bottle feeding to ear infections were disregarded by 232(66.3%) respondents and 258(73.7%) respondents did not consider smoking as one of the factors related to ear diseases. More than half of the respondents i.e., 188(53.7%) felt that serious ear infections cannot occur in young children.

Category 2: Perception of respondents about cholesteatoma (Table 2)

The majority of the respondents i.e., 230(65.7%) were not aware of a disease like cholesteatoma with bone eroding properties occurring inside the ear, and in 224(64%) respondents opined that it cannot be present Inside the ear as a disease without any visible symptoms. While itching in the ear was identified by 219(62.6%) respondents as a symptom of ear disease, giddiness was disregarded by majority of the respondents i.e., 228(65.1%) as related to ear infections.

Category 3: Common symptoms of middle ear infection

The majority of respondents correctly identified common symptoms of ear infections like earpain i.e., 326(93.1%), ear discharge i.e 324(92.6%), hearing loss i.e., 308(88%).

Ringing sensation in the ear was identified less frequently i.e., by 239(68.3%) respondents.

Category 4: Uncommon symptoms of middle ear infections

Itching in the ear was identified less frequently i.e. 219(62.6%), as a symptom of middle ear serious infections. Giddiness was disregarded by the majority of the participants i.e., 228(65.1%) as a symptom of ear infections.

Category 5: Knowledge regarding the intratemporal complications (Table 3)

A large number of respondents disregarded the possibility of spread of ear infections outside the ear-to the bone around the ear i.e., 175(50%), to the nerve causing permanent hearing loss i.e., 152(43.4%),to the neck causing neck swellings i.e., 197(56.3%), to cause deviation of the angle of

mouth i.e., 244(69.7%), to cause eye problems like blurring of vision/ double vision i.e., 229(65.4%), to cause severe giddiness i.e., 192(54.9%).

Category 6: Knowledge regarding intracranial complications (Table 4)

More than half of the respondents disregarded that general body symptoms could be related to complications of untreated ear infections; like difficulty in balance while walking or standing, weakness of limbs, etc. i.e., 219(62.6%), fits/convulsions in 260(74.3%), etc. A significant portion of respondents also did not know that ear infections can spread to the inside of the skull i.e.in 248(70.9%), spread to the brain i.e., 235(67.1%), complications can itself may lead to death i.e., 291(83.1%).

Category 7: Harmful practices considered safe by respondents in CSOM patients (Table 5)

Many harmful practices were considered safe for patients with ear infections by a large number of respondents like cleaning the ear with ear buds 168(48%), cleaning the ear with mineral (bottled) water 139(39.7%), taking head bath as usual (without precautions) 133(38%), putting herbal medicines into the ear 124(35.4%), putting oil into the ear 121(34.6%), cleaning the ear with tap water 115(32.9%), swimming as usual (without precautions) 108(30.9%), getting the ear cleaned by other people 103(29.4%), cleaning the ear with safety pins/ match sticks 99(28.3%), Self medication with any ear drops from local pharmacy 70(20%). (Figure V)

Complications of various knowledge, attitude and practices related aspects into good and poor levels in each of the 7 categories (Table 6)

Among 350 respondents, majority exhibited poor level of knowledge/awareness about COM, especially Cholesteatoma; with regards to knowledge categories “Category 1 -“General perceptions about ear infections” in 295(84.3%);“Category 2 –Perceptions about Cholesteatoma in 246(70.3%);“Category 5- Knowledge about loco-regional/Intra temporal complications in 244(69.7%); “Category6-Knowledge about General body complaints/ Intracranial complications in 247(70.6%);“Category 7-Harmful practices considered safe by participants in CSOM patients” in 279(79.7%).

A good level of knowledge was exhibited by respondents for symptoms of COM only in two categories; “Category 3- Knowledge about common ear symptoms in COM” in 313(89.4%), and “Category 4- Knowledge about Less commonly reported symptoms of COM” in 258(73.7%).

Bivariate and multivariate analysis of the data (Table 7)

The bivariate analysis gave rise to the following significant findings:

- Those respondents with education of middle school and below were 2.03times more prone for having less overall knowledge on ear disease related factors (this association was also statistically significant ($p < 0.05$) than those with higher education. In contrary to the applied assumption, those with unskilled jobs or no occupation were less likely ($OR = 0.56$) to have poor overall ear disease knowledge than those with skilled or professional jobs (and this was also statistically significant).
- Those with no history of ear surgeries were found to be 1.68 times more likely to have less knowledge on ear disease than those who have had ear surgeries, but this was not statistically significant ($p > 0.05$) and moreover, the confidence interval of ODDS ratio included zero also.

The Multivariate Analysis

The Multivariate analysis (where the possible confounding factors were adjusted for) of same socio demographic and ear disease related history with overall knowledge on ear disease gave rise to two interesting findings:

- Those with less education were found to be less likely ($OR = 0.49$) to have poor knowledge on ear disease and was statistically significant, this is in contrary to applied assumption and to the findings of bivariate analysis. Similarly the finding of bivariate analysis that unskilled and unemployed being protected from less knowledge on ear disease was proved wrong in multivariate

analysis; where they were found to be 1.76 times more likely to have poor ear disease knowledge than those who are skilled or professionals and this finding was statistically significant.

b. Those from rural area and those without any history of ear disease were found to be 1.69 and 1.35 times more likely to have less ear disease knowledge than their counter parts, but these associations were not statistically significant ($p>0.05$) and more over, the confidence interval of ODDS ratio included zero also.

Cat. 1 General perceptions about ear infections	No Frequency(%)	Yes Frequency(%)
1. Is Bottle feeding in children related to ear infections?	232(66.3%)	118(33.7%)
2. Is Smoking related to ear diseases?	258(73.7%)	92(26.3%)
3. Are Nose and throat conditions related to ear infections?	116(33.1%)	234(66.9%)
4. Is Ear infection, a disease of only poor people?	241(68.9%)	109(31.1%)
5. Can ear discharge be caused by a hole in the ear drum?	117(33.4%)	233(66.6%)
6. Can using of some ear drops cause damage to the ear?	194(55.4%)	156(44.6%)
7. Can serious Ear infections be present in young children also?	188(53.7%)	162(46.3%)

Table 1: Category 1- General perception about ear infection (n=350)

Cat. 2 Perceptions of respondents about cholesteatoma	No Frequency (%)	Yes Frequency (%)
1. Can bone damaging disease occur inside the ear?	230(65.7%)	120(34.3%)
2. Is Ear drum disease with ear discharge is more serious than without discharge?	174(49.7%)	176(50.3%)
3. Can the bone damaging disease be present inside the ear without any symptoms?	224(64%)	126(36%)
4. Does the stoppage of ear discharge always indicate the cure of ear disease?	186(53.1%)	164(46.9%)

Table 2: Category 2- Perception of respondents about cholesteatoma (n=350)

Cat. 5 Where do you think Ear infection can spread to?	No Frequency(%)	Yes Frequency(%)
1. Bones around the ear	175(50%)	175(50%)
2. To nerve causing permanent hearing loss	152(43.4%)	198(56.6%)
3. To neck causing neck swelling	197(56.3%)	153(43.7%)
4. Deviation of the angle of mouth to one side	244(69.7%)	106(30.3%)
5. Eye problems like blurring of vision/ double vision	229(65.4%)	121(34.6%)
6. Giddiness	192(54.9%)	158(45.1%)

Table 3: Category 5: Knowledge about locoregional spread/Intratemporal complication (n=350)

Cat. 6 According to you, Untreated ear infection can cause which symptoms in the body?	No Frequency (%)	Yes Frequency (%)
1. Fever with chills and rigors	115(32.9%)	235(67.1%)
2. Vomiting	139(39.7%)	211(60.3%)
3. Headache	93(26.6%)	257(73.4%)
4. Difficulty in balance while walking or standing, weakness of limbs	219(62.6%)	131(37.4%)
5. Spread in side skull	248(70.9%)	102(29.1%)
6. Spread to the brain	235(67.1%)	115(32.9%)
7. Fits/convulsions	260(74.3%)	90(25.7%)
8. Potential to cause death	291(83.1%)	59(16.9%)

Table 4: Category 6: Knowledge about systemic complaints /Intracranial complications

Cat. 7: Which of the following practices, do you think, can be done safely if a person is having ear infections	No Frequency (%)	Yes Frequency (%)
1. Taking head bath as usual (without precautions)	217(62%)	133(38%)
2. swimming as usual (without precautions)	242(69.1%)	108(30.9%)
3. Cleaning the ear with ear buds	182(52%)	168(48%)
4. Cleaning the ear with safety pins/ match sticks	251(71.7%)	99(28.3%)
5. getting the ear cleaned by other people	247(70.6%)	103(29.4%)
6. cleaning the ear with tap water	235(67.1%)	115(32.9%)
7. Cleaning the ear with mineral(bottled)water	211(60.3%)	139(39.7%)

8. putting her bal medicines into the ear	226(64.6%)	124(35.4%)
9. putting oil into the ear	229(65.4%)	121(34.6%)
10. Self medication with any ear drops from local pharmacy	280(80%)	70(20%)

Table 5: Harmful practices considered safe by respondents in CSOM patients

Good level-equal to or more than 40% of correct responses, Poor level-Less than 40% correct responses.

Knowledge Attitude and Practice (KAP) score categories (n=350)	Median score (Min.-Max.)	Level of knowledge (n=350)	
		Good	Poor
Cat.1-General perceptions about ear infections	3(0-7)	55(15.7%)	295(84.3%)
Cat.2-Perceptions about Cholesteatoma	2(0-4)	104(29.7%)	246(70.3%)
Cat.3-Knowledge about common ear symptoms in COM	4(0-4)	313(89.4%)	37(10.6%)
Cat.4-Knowledge about Less commonly reported symptoms	1(0-2)	258(73.7%)	92(26.3%)
Cat.5-Knowledge about locoregionalspread/ Intratemporal complications	3(0-6)	106(30.3%)	244(69.7%)
Cat.6-Knowledge about systemic symptoms/ Intracranial complications	3(0-8)	103(29.45%)	247(70.6%)
Cat. 7-Harmful practices considered safe by respondents in COM patients.	3(0-10)	71(20.3%)	279(79.7%)

Table 6: Complications of knowledge levels of respondents into good and poor levels in each categories

Variables	Overall knowledge on middle ear infection		Bivariate analysis		Multivariate analysis	
	Good	Poor	Reference category	P-value	Reference category	P-value
	N (%)	N (%)	Odds ratio		Adjusted odds ratio	
	N=249	N=101	(95% CI)		(95% CI)	
Age category						
45 years and above	62	28	1	0.961	1	0.961
Less than 45 years	187	73	0.986		1.014	
			(0.570-1.708)		(0.585-1.756)	
Gender						
Female	109	50	1	0.247	1	0.247
Male	140	51	0.745		1.342	
			(0.453-1.226)		(0.816-2.207)	
Education Level						
High school and above	179	58	1	0.009*	1	0.009*
Middle school and below	70	43	2.036		0.491	
			(1.190-3.483)		(0.287-0.840)	
Occupation						
Professional/Skilled/Business	72	34	1	0.048*	1	0.048*
Others and unemployed	177	67	0.566		1.766	
			(0.323-0.994)		(1.006-3.100)	
SES						
Middle and Upper Classes	151	61	1	0.916	1	0.289
Lower class	98	40	0.974		0.42	
			(0.595-1.593)		(0.084-2.091)	
Residential Area						
Urban	96	26	1	0.053	1	0.053
Rural	153	75	0.591		1.693	
			(0.346-		(0.992-	

			1.008)		2.888)	
Presence of ear disease						
Yes	30	9	1	0.468	1	0.468
No	219	92	0.741		1.350	
			(0.329-		(0.600-	
			1.667)		3.039)	
Past history of ear surgeries						
Yes	7	4	1		1	
No	242	97	1.685	0.438	0.594	0.438
			(0.451-		(0.159-	
			6.293)		2.218)	
Table 7: Bivariate and multivariate analysis of socio-demographic factors with overall knowledge on middle ear infection						

DISCUSSION

In a study done in rural India, it was noted that socio-demographic factors as well as poor knowledge and attitudes and unhealthy practices with respect to risk factors of otitis media contribute to the high prevalence of otitis media. However, this study addressed only the risk factors for Otitis media in children. It did not include the assessment of knowledge about cholesteatoma and its complications.^[6]

In our study, which only explored the knowledge levels of people in ear disease related issues and not the prevalence of ear disease, on contrary to our assumption, those with less education were found to be less likely to have poor knowledge of ear diseases; in other words higher educational level was found to be a determinant of lesser knowledge on ear disease. This might be against the prevailing popular as well as scientific evidence but the finding in our study was statistically significant. Multivariate analysis had shown that those with unskilled jobs or no occupation were more likely (OR = 1.766) to have poor overall ear disease knowledge than those with skilled or professional jobs (and this was also statistically significant). This is consistent to the existing evidence that skilled workers and professionals are more likely to have good knowledge in health related issues.^[7]

Those from the rural area and those without any history of ear disease were found to be 1.69 and 1.35 times more likely to have less ear disease knowledge than their counter parts, but these associations were not statistically significant ($p > 0.05$) and moreover, the confidence interval of ODDS ratio included zero also.

Another study done on the admitted patients with complications of COM observed that intratemporal complications were seen in 88.46% of the patients while 11.53% had intracranial complications. Overall awareness was poor.^[8] This study included only the admitted patients with CSOM complications and awareness among the general population may be poorer.

According to some studies, only 44.7% of CSOM patients were aware that surgery can cure the CSOM. Early surgery was said to be beneficial by 25.3% patients.^[9,10] In our study, a large number of the respondents were aware of the treatment options available for ear infections like eardrops(90%), tablets (79.1%), surgeries (68.6%).

In a study from a rural area of Nepal, 14.7% relied on household remedies like oil, herbs instilled into the ears and 2.94% would go to faith healer. Use of antibiotics was perceived as the sole method to treat otitis media by 75.5% of the attendants.^[11] In our study, a large number of respondents considered many harmful practices as safe for patients with ear infections like cleaning the ear with ear buds (48%), cleaning the ear with mineral (bottled) water(39.7%), Taking head bath as usual (without precautions) (38%), putting herbal medicines into the ear(35.4%), putting oil into the ear(34.6%), cleaning the ear with tap water(32.9%), swimming as usual (without precautions) (30.9%), getting the ear cleaned by other people(29.4%), Cleaning the ear with safety pins/ match sticks(28.3%), Self-medication with any eardrops from local pharmacy(20%).

Further research studies are required including a larger sample size or community based designs to further establish the relationship between various socio demographic variables and knowledge domains regarding cholesteatoma, which can enhance the public education programs.

In India, there is a national program for the prevention and control of deafness, which aims at early identification, diagnosis and treatment of ear problems responsible for hearing loss and deafness.^[12] This mainly focuses on the causes of deafness and its prevention, treatment and rehabilitation. Our study points towards the need to address the various factors in the national program like to create awareness about the insidious nature, lack of symptoms and signs in cholesteatoma, which can lead to delayed diagnosis and poor outcomes in terms of hearing ability.

Further research studies are needed including a larger sample size or community based designs to further establish the relationship between various socio demographic variables and knowledge domains regarding cholesteatoma. Hence, the implications of delayed diagnosis and management of chronic diseases like COM/cholesteatoma should also be kept under vigilance to prevent complications. This study also points towards various factors which need to be kept in mind while creating public awareness programs regarding COM and its complications.

Merits of this study are good number of respondents, and one of the few studies done till now focusing on awareness about Cholesteatoma, detailed questionnaire, robust statistical analysis techniques applied.

Limitations of this study is that, it was conducted on the hospital visitors. More community based studies will give even clearer picture about the knowledge and awareness among general public. On statistical analysis, one result was generated in contrary to general assumption of education status and level of awareness. This finding needs further evaluation, on larger sample size.

CONCLUSION

This study provides an insight into the lack of awareness and knowledge about ear diseases risk factors, symptoms, harmful habits, complications and misconceptions; especially regarding COM; more specifically related to cholesteatoma and its complications among general population, especially rural and even in well educated populations. Given its high prevalence, lack of symptoms, delayed care- seeking, high chances for complications, and limited availability of resources, there is an urgent need for public health measures to create awareness among the general population regarding cholesteatoma and its complications, to prevent a potential increase in the incidence of complications.

Declarations

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Conflicts of interest

The authors declare that there are no conflicts of interest.

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guidelines on human experimentation. Institutional Ethics Committee approval was obtained, before commencement of the study. (SMVMCH-EC no. 43/2020) (Human Studies)

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