

A Clinicopathological Study on Chronic Otitis Media in Children at a Tertiary Care Hospital

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Abstract

Original Research Article

Introduction: Chronic otitis media (COM) is the commonest disorder in Otorhinolaryngology practice, characterized by chronic inflammation of the middle ear cleft and mastoid cavity which presents with recurrent ear discharge and deafness. It results in considerable morbidity and may even cause extra-cranial and intracranial complications. Infections of the middle ear and complications caused by COM are still major public health problems in developing countries like Bangladesh. It is one of the main causes of preventable hearing loss when treated appropriately. It is important to review the changing trends in the natural history of the disease, and associated clinicopathological findings to understand the pathogenesis & initiate definitive treatment. **Aim of the study:** The aim of the study was to the clinicopathological outcome of chronic otitis media in children at a tertiary care hospital. **Methods:** This is an observational prospective study, a total of 80 patients were included and analyzed in this study. The study was done on patients attending the Tairunnessa Memorial Medical College Hospital, Tongi, Gazipur, Bangladesh from January 2020 to July 2021. **Result:** A total of 80 patients were included in the study, the result is described in two groups. In the safe (mucosal) type, the majority of the patients presented with a profuse, non-smelly mucopurulent discharge followed by hearing loss. The perforations were 63% in the attic while 37% had marginal perforations. The hearing loss was mainly conductive in nature but moderate in degree. There were also associated extracranial complications in this group. In both groups, most patients were female and the majority belongs to the rural population. **Conclusion:** Chronic otitis media in the pediatric age group is more prevalent in rural populations with otorrhoea being the commonest presenting complaint. Conductive hearing loss of mild to moderate degrees is almost always associated with both mucosal and squamosal forms of the disease.

Keywords: Clinicopathological, chronic middle ear, Chronic Otitis Media.

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INTRODUCTION

Chronic suppurative otitis media (CSOM) describes chronic middle ear (ME) disease and is defined as 'chronic inflammation of the middle ear and mastoid cavity, which presents with recurrent ear discharge or otorrhoea through a tympanic membrane perforation'. The term chronic otitis media (COM) is a better term to encompass the varied pathology seen as a result of chronic ME inflammation [1]. The disease pathogenesis may sometimes begin in childhood as a spontaneous tympanic membrane perforation due to acute infection of the middle ear known as acute otitis media, or as a sequela of less severe forms of otitis media, associated with eustachian tube dysfunction &

retraction pocket formation or perforation of the tympanic membrane. The onset of the disease may occur in adulthood as well and causes hearing impairment. The spectrum of COM ranges from a relatively benign condition to a cause of death from intracranial complications. Mostly it is painless otorrhoea, when water enters into ears or an episode of upper respiratory tract infection occurs, which subsides on medical management only to recur again. So most of the cases suffer little from the annoyance of running ears, thereby delaying definitive management. The effect on hearing is variable; the hearing loss is often perceived as slight even though both ears are severely affected. Thereby negligence runs them into the risk of more advanced disease with bone destruction, threats of

intra-or extra-cranial complications & severe degrees of hearing loss, and even profound hearing loss which may be irreversible even after surgical treatment of the disease. On the other hand, some of the patients have chronic ill health, headache, giddiness, deafness and the continued presence of pus in the ear, which is often offensive & distressing; thereby the patients are handicapped in various occupations. COM is an important cause of acquired and preventable hearing loss, especially in developing countries. Incidence of COM varies from 0.5%–to 2% in developed countries whereas in developing countries it varies from 3%–to 57%. In Bangladesh, the incidence of COM is up to 12.44% [2]. So in the present article, we tried to encompass these factors for a better understanding & management of COM, an important public health problem. *The aim of the study was to the clinicopathological outcome of chronic otitis media in children at a tertiary care hospital.*

METHODOLOGY & MATERIALS

This is an observational prospective study, a total of 80 patients were included and analyzed in this study. This is an observational prospective study, a total of 80 patients were included and analyzed in this study. The study was done on patients attending the Tairunnessa Memorial Medical College Hospital, Tongi, Gazipur, Bangladesh from January 2020 to July 2021.

- **Inclusion criteria**

Patients with the age group of <14 years, chronic otitis media mucosal variety, chronic otitis media squamosal variety, patients not received antibiotics for the past 5 days and patients not underwent any surgical treatment for chronic otitis media were included in the study.

- **Exclusion criteria**

Patients who had age >14 years, chronic otitis media mucosal variety, patients who received antibiotics for the past 5 days and patients who underwent surgical treatment for chronic otitis media were included in the study.

Sample technique and sample size

The patients were subjected to a detailed history, general examination, systemic examination, and local examination, including clinical examination of the ear, nose, paranasal sinuses, larynx, and pharynx. Informed consent was taken from all these patients. Patients with external ear pathology were excluded from the study. The study protocol was approved by the ethical committee. A total of 80 patients who fulfilled the inclusion criteria were considered for the study. A detailed otological evaluation was done for these patients. These patients were divided into two groups—safe (mucosal) type i.e., perforation in the pars flaccida of the eardrum, and unsafe (squamous) type i.e., perforation in the pars flaccida of the eardrum, each group having 40 patients. Data were analyzed by using SPSS 20. Frequency and percentages were calculated for qualitative variables while mean \pm standard deviation was calculated for quantitative variables. To perform adjusted comparisons, the Chi-square test and t unpaired test were applied. P-values as presented in the results. $P < 0.05$ was considered significant while $p < 0.01$ was considered highly significant.

RESULT

A total of 80 patients were included in the study, the result is described in two groups. In the safe (mucosal) type, the majority of the patients presented with a profuse, non-smelly mucopurulent discharge followed by hearing loss. Some patients had tinnitus. Everyone had a central perforation and the majority had mild conductive hearing loss. There were no associated complications. In the unsafe (squamous) type, the majority of patients presented with scanty, mucopurulent aural discharge which was foul-smelling followed by hearing loss. Other common presenting complaints were earache, tinnitus, vertigo, headache and nausea and vomiting. Retraction pocket and cholesteatoma were common findings in this group. The perforations were 63% in the attic while 37% had marginal perforations. The hearing loss was mainly conductive in nature but moderate in degree. There were also associated extracranial complications in this group. In both groups majority of patients were female and the majority belong to the rural population.

Table-1: Gender distribution of the study population (N=80)

Sex	Safe CSOM (N=40)		Unsafe CSOM (N=40)	
	N	%	N	%
Male	17	42.5	19	47.5
Female	23	57.5	21	52.5

Table-2: Side of ear involved in each group

Side of ear	Safe CSOM (N=40)		Unsafe CSOM (N=40)	
	N	%	N	%
Right	7	17.5	20	50
Left	13	32.5	16	40
Both	20	50	4	10

Table-3: Presenting symptoms of patients in each group

Symptoms	Safe CSOM (N=40)		Unsafe CSOM (N=40)	
	N	%	N	%
Discharge	40	100	40	100
Hearing loss	36	90	39	97.5
Tinnitus	16	40	15	37.5
Earache	7	17.5	19	47.5
Vertigo	1	2.5	11	27.5
Fever	1	2.5	4	10
Headache	1	2.5	9	22.5
Nausea and vomiting	0	0	7	17.5

Table-4: Fisher's exact test for symptoms

Variables	P-value
Hearing loss	0.612
Headache	0.052
Vertigo	0.026
Fever	0.612
Nausea and vomiting	0.052

Table-5: Otologic findings in each group

Signs	Safe CSOM (N=40)		Unsafe CSOM (N=40)	
	N	%	N	%
Perforation	40	100	40	100
Retraction pocket	0	0	28	70
Cholesteatoma	0	0	21	52.5
Granulation	0	0	9	22.5
Polyp	0	0	8	20
Tympanosclerosis	8	20	7	17.5
Ossicular erosion	3	7.5	9	22.5
Post auricular swelling	0	0	8	20
Post auricular fistula/sinus	0	0	5	12.5
Facial paralysis	0	0	3	7.5
Unconsciousness	0	0	1	2.5

Table-6: Fischer's exact test for sings

Variables	P-value
Granulations	0.011
Polyp	0.024
Ossicular erosions	0.011
Post auricular swelling	0.024
Post auricular sinus/fistula	0.011
Facial paralysis	0.492
Unconsciousness	1

Table-7: Distribution of patients according to characteristics of discharge.

Variables		Mucosal		Squamosal	
		N	%	N	%
Type of discharge	Purulent	12	30	4	10
	Mucoid	3	7.5	5	12.5
	Mucopurulent	25	62.5	27	67.5
	Bloodstained	0	0	4	10
Amount of discharge	Profuse	36	90	6	15
	Scanty	4	10	34	85
Smell of discharge	Foul-smelling	4	10	36	90

Table-8: Distribution of patients according to the type of perforation.

Variables	Central	Marginal	Attic
Safe	40	0	0
Unsafe	0	15	25

Table-9: Distribution of patients according to the type of hearing loss.

Variables	Conductive	SNHL	Mixed	No loss
Safe	30	3	4	3
Unsafe	32	3	5	0

Table-10: Distribution of patients according to the severity of hearing loss.

Variables	Mucosal		Squamosal	
	N	%	N	%
Normal	3	7.5	1	2.5
Mild	20	50	13	32.5
Moderate	13	32.5	19	47.5
Moderately severe	4	10	7	17.5
Severe	0	0	0	0
Profound	0	0	0	0

DISCUSSION

CSOM is one of the most common ear diseases in our country. This study was conducted to analyse the clinicopathological spectrum of this disease in children. In this study majority of patients were from rural areas, this may be because of the low socioeconomic status and low education status of people there. Poor living conditions, overcrowding, poor hygiene, malnutrition, inaccessibility to good medical facilities, ignorance on the part of patients and inadequate specialized medical facilities have been suggested as a basis for the widespread prevalence of CSOM in developing countries. Similar results were found in studies by Islam *et al.*, Johnson, Siddique *et al.* and Bennett *et al.*, [3-6] Aural discharge was found to be the commonest complaint amongst both mucosal and squamosal groups of patients. Most of the mucosal group of patients had profuse mucopurulent discharge as compared to the squamosal group where the majority had a scanty foul-smelling discharge. Tshering *et al.*, Shrestha *et al.*, Rao *et al.*, and Rehman *et al.*, also report similar data in their study [7-10]. Hearing loss was the second most common symptom in the safe (mucosal) group, tinnitus and earache were the next commonest symptoms. Studies by Shrestha *et al.*, Tshering *et al.*, and Rehman *et al.* had similar findings [7, 8, 10]. Islam *et al.* report 100% of patients having hearing loss among the tubotympanic group which was not correlated with our study [3]. This may be because patients are more annoyed by the discharge in the ear and hence few couldn't notice the accompanying hearing loss with it. As per a study by Baba *et al.* 47.6% of patients with CSOM had tinnitus pre-operatively whereas Kim *et al.* had an incidence of 43% with 87% having sensorineural tinnitus [11, 12]. In our study, among unsafe (squamous) type, out of 40 patients 96.66% patients had a hearing loss; 37.5% patients had tinnitus; 47.5% patients had earache; 27.5% patients had vertigo; 22.5% patients had a headache; 17.5% patients had complained

of nausea and vomiting; 10% patients had a fever. These findings are in good correlation with studies done by Shrestha *et al.*, Rehman *et al.*, and Weilinga *et al.* [8, 10, 13]. Hearing loss are greater in unsafe (squamosal) types probably due to more damage to the sound conducting system in this condition, which can be minimized by treating the disease in the time. In the tubotympanic group of patients, a perforation in pars flaccida of the tympanic membrane was the commonest otoscopic finding. Infection was the major etiological factor of tympanic membrane perforation (TMP). In the majority of the patients, the disease started with an acute episode of otitis media which was associated with upper respiratory tract infection and later resulted in a permanent perforation. Findings of retraction pocket (70%), cholesteatoma flakes (52.5%), and ossicular erosion (22.5%), granulations and polyps (22.5%) were more prevalent among squamosal disease patients. Tshering *et al.*, Rehman *et al.* and Islam *et al.* also report similar incidences in their study [3, 7, 8]. TMP is a condition as old as the human species [14]. TMPs can result from disease (particularly infection), trauma, or medical care. Perforations can be temporary or persistent. The effect varies with size, location on the drum surface, and associated pathologies conditions. In our study, among safe (mucosal) type each patient had central perforation and in unsafe (squamous) type, 63.33% of patients had attic perforation and 36.66% of patients had marginal perforation. Our study is in concurrence with Islam *et al.* and Tshering *et al.* [3, 7]. Hearing loss is mainly conductive in patients with CSOM but few studies suggest that CSOM can also lead to the sensorineural components in hearing loss. Our study is not in concurrence with Kaur *et al.* found 24% patients of with CSOM had mixed hearing loss; Gardenghi *et al.* found that 44% of their patients with CSOM had a cochlear hearing loss; Bluvshstein reported that 37.5% of his patients with CSOM had some loss of cochlear function, Islam *et al.* showed a 17.7%

incidence of mixed hearing loss in patients with CSOM; Gulati *et al.* had found 22.5% incidence of mixed hearing loss in patients with CSOM [3, 15-18]. In our study, among unsafe (squamous) type, out of 30 patients, the majority (80%) had the conductive type of hearing loss, 6.66% patients had SNHL type, 13.33% patients had mixed type of hearing loss and none had any hearing loss. This correlates with findings in a study by Tshering *et al.* [7]. However there are no studies establishing a relation of SNHL with cholesteatoma or ossicular erosion [19]. The majority of patients with mucosal disease had mild conductive hearing loss as compared to the squamous group where a majority had moderate conductive hearing loss. None of the patients had severe or profound hearing loss in either group; however percentage of patients with moderately severe hearing loss was higher in the squamous group of patients. These findings are well supported by studies by Tshering *et al.* and Islam *et al.* [3, 7] CSOM complications, despite their reduced incidence, still pose a great challenge in developing countries as the disease is present in the advanced stage leading to difficulty in management and consequently higher morbidity and mortality. In our study, among safe (mucosal) type, out of 30 patients, no patients had any complications. Cholesteatoma had the property of erosion of the surrounding bones, and end up with intracranial or extra-cranial complications. In our study, among unsafe type, 40% of patients had extracranial complications which included postauricular swelling (20%), postauricular sinus/fistula (13.33%), and facial paralysis (6.66%) and 3.33% of patients came unconsciously. Tshering *et al.*, Shrestha *et al.* and Islam *et al.* had similar results [3, 7, 9].

Limitations of the study

Large sample size would have been better for concluding. Radiological and surgical findings also needed to be studied for a better understanding of the disease.

CONCLUSION AND RECOMMENDATIONS

Chronic otitis media in the pediatric age group is more prevalent in rural populations with otorrhea being the commonest presenting complaint. Conductive hearing loss of mild to moderate degrees is almost always associated with both mucosal and squamous forms of the disease. The unsafe (squamous) variety of COM was associated with a foul-smelling, scanty discharge with more degree of hearing loss and complications than the safe (mucosal) variety of COM. There was no statistically significant difference between safe (mucosal) and unsafe (squamous) diseases regarding age, gender and rural/urban populations. There is a need to create awareness about the importance of personal hygiene, early visits to a health care worker for ear complaints, and regular follow up.

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