Analysis of Chronic Suppurative Otitis Media Cases in Chattogram: Pattern and Prevalence Insights

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Abstract

Background: Chronic Suppurative Otitis Media (CSOM) is a commonly encountered disease among the population of developing countries like, Bangladesh. It is prevalent among people with low socio-economic status, over gathered families, recurrent upper respiratory tract infections, poor hygiene, etc. This study aimed at determining the prevalence and pattern of CSOM in population of Chattogram.

Materials and methods: A descriptive cross sectional study was carried out from September 2023 to February 2024 at the outdoor department of Otorhinolaryngology of BGC Trust Medical college Hospital and Society for Assistance to Hearing Impaired Children (SAHIC) Chattogram.

Results: Among 400 patients with Otitis Media 239 had CSOM. 155(64.85%) were female and 84(35.14%) were male. Patients with age ranging from 0-10 years, 63 (26.35%) were prevalent. 138(57.74%) patients with poor socioeconomic status and overcrowded families were frequently attacked with CSOM. 141(59.0%) had habit of bathing in pond. 100(41.84%) used cotton buds and 100(41.84%) used feathers, vegetable sticks and wooden sticks to clean their ears. 214(89.53%) had Tubo-tympanic variety and 25(10.46%) had Attico-antral variety of CSOM. 215(89.95%) had discharge with CSOM .

Conclusion: CSOM affects adults as well as children. Neglect towards its treatment can hamper daily activities, with a poor quality of life, followed by extra-cranial or intra-cranial manifestations.

Key words: Attico-antral CSOM; Chronic Suppurative Otitis Media (CSOM); Tubo-tympanic CSOM.

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Introduction

Chronic Suppurative Otitis Media (CSOM) is a common health associated disease in a developing country like Bangladesh hampering the day to day life. The disease and its related issues create an unseen challenge, jeopardizing children's academic success, hindering the development of language and speech, and impacting cognitive abilities in future.[1] CSOM is an infection characterized clinically by recurrent middle ear discharge through a persistent perforation of the tympanic membrane more than three months.[2,3] The occurrence of this ailment is elevated in developing nations, particularly within socioeconomically disadvantaged populations, owing to factors such as malnutrition, overcrowded living conditions, suboptimal hygiene practices, insufficient healthcare access, and recurrent upper respiratory tract infections. In these developing regions, there exists a variation in the prevalence of the disease among distinct socioeconomic strata within the community.[4,5] Chronic Suppurative Otitis Media (CSOM) results in mild-to-moderate hearing impairment in 50% of cases and stands as a significant contributor to hearing loss in the developing regions. Therefore, it is imperative to enhance public awareness regarding this ailment to mitigate the morbidity arising from its complications.[6] Moreover, a considerable percentage of individuals with untreated Chronic Suppurative Otitis Media (CSOM) (1–18%) manifest severe complications such as mastoid abscess, otitic meningitis, venous sinus thrombosis and cholesteatoma. Annually, approximate 28,000 fatalities are ascribed to the complications arising from CSOM.[7-10] The otoscopic observations in individuals with Chronic Suppurative Otitis Media (CSOM) typically reveals the existence of a defect or perforation in either the pars tensa or pars flaccida of the tympanic membrane. CSOM is categorized into tubotympanic and attico-antral diseases, with the latter often concomitant with the presence of cholesteatoma.[11]

This study aimed at determining the socio-demographic pattern, clinical presentation and associated factors in patients with CSOM in population of Chattogram.

Materials and methods

This study was a cross sectional type of observational study which was conducted among outdoor patients attending BGC Trust Medical College hospital and SAHIC, Chattogram from September 2023 to February 2024. The protocol of this study was approved by the ethical and review committee of the institution were study was held.

Inclusion criteria

- Patients with Otitis Media were included in the study.

Exclusion criteria

- Patients of Otitis Media with Intracranial and Extracranial manifestation were excluded from this study.

Verbal consent was taken from all the participants. The demographic data, history of related sign and symptoms of Otitis media, Otoscopic finding, and tuning fork test of the patients were recorded in the data collection form. Symptoms and Otoscopic results were used to diagnose different type of Otitis Media. Prevalence of Chronic Suppurative Otitis Media (CSOM) were calculated. The data were analyzed using the statistical package for social sciences version 24 (SPSS 24). The data were presented as frequencies and percentages. Chi square test was done to analyze the different categorical variables.

Results

Prevalence of CSOM, among patients with Otitis media were 59.75% (239/400). Among the patients with CSOM, 84 (35.14%) were male and 155 (64.85%) were female. CSOM were more prevalent among patients with the age range 0-10 years (26.35%) and 21-30 years (21.75%). 225 (94.14%) of the patients had symptoms of CSOM for more than 12 weeks.138 (57.74%) of the patients with CSOM belong to poor class. Overcrowding families with 4-6 members (42.67%) and > 7 members (33.05%) suffered from CSOM more. The relationship between age range (p= 0.000), duration of symptoms of CSOM (p=0.000) and prevalence of CSOM was found statistically significant (Table I).

Table I Association between CSOM status and socio-demographic characteristics of study population

Characteristics	Presence of CSOM		Chi square (χ^2)	p value(p)
	Yes n=239 (Percentage)	No n=161 (Percentage)		
Gender				
Male	84(35.14)	68(42.23)	2.052	0.152
Female	155(64.85)	93(57.76)		
Age (Years)				
0-10	63(26.35)	32(19.87)		
11-20	40(16.73)	15(9.3)	27.528	0.000*
21-30	52(21.75)	46(28.57)		
31-40	28(11.71)	25(15.52)		
41-50	26(10.87)	3(1.86)		
51-60	16(6.6)	21(13.04)		
>60	14(5.8)	19(11.80)		
Duration week				
<4	5(2.0)	127(78.88)	264.164	0.000*
4-8	6(2.51)	6(3.72)		
8-12	3(1.2)	1(0.62)		
>12	225(94.14)	27(16.77)		
Socio-economic status				
Poor	138(57.74)	84(52.17)	1.633	0.442
Middle	91(38.07)	67(41.61)		
High	10(4.1)	10(6.21)		
Number of Family members				
3	58(24.26)	41(25.46)	8.101	0.017*
4-6	102(42.67)	87(54.03)		
7 & >7	79(33.05)	33(20.49)		

Regarding the symptoms, 34(14.2%) of the patients had allergic rhinitis. 186 (77.8%) were vaccinated under EPI Schedule. 62 (25.9%) had history of adenoids. Individuals with a family history of CSOM were 72(30.1%). 131 (54.8%) suffered from Rhinosinusitis, 99 (41.4%) had deviated nasal septum (DNS), 88 (36.8%) had Hypertrophy Inferior Turbinate (HIT). 54 (22.6%) suffered from tinnitus, 166 (69.5%) had Eustachian tube malfunction. 120 (50.2%) suffered from deafness, 85 (35.6%) had earache, 10 (4.2%) had tonsillitis.

Those vaccinated under EPI (p=0.046) having symptoms of Rhinosinusitis (p=0.010) and deafness (p=0.000) were statistically significant with presence of CSOM (Table II).

Table II Association of CSOM status with symptoms

Characteristics	Presence of CSOM		Chi square	p value (p)
	Yes n=239 (Percentage)	No n=161 (Percentage)	(χ^2)	
Allergic rhinitis				
Yes	34 (14.2)	43 (26.7)	9.642	0.002
No	205 (85.8)	118 (73.3)		
Vaccination under EPI				
Yes	186 (77.8)	111 (68.9)	3.968	0.046*
No	53 (22.2)	50 (31.1)		
History of adenoid				
Yes	62 (25.9)	33 (20.5)	1.575	0.210
No	177 (74.1)	128 (79.5)		
Family history of CSOM				
Yes	72 (30.1)	14 (8.7)	26.175	0.000*
No	167 (69.9)	147 (91.3)		
Rhinosinusitis				
Yes	131 (54.8)	67 (41.6)	6.702	0.010*
No	108 (45.2)	94 (58.4)		
Deviated nasal septum				
Yes	99 (41.4)	75 (46.6)	1.043	0.307
No	140 (58.6)	86 (53.4)		
Hypertrophy inferior turbinate				
Yes	88 (36.8)	52 (32.3)	0.865	0.352
No	151 (63.2)	109 (67.7)		
Vertigo				
Yes	12 (5.0)	11 (6.8)	0.582	0.445
No	227 (95.0)	150 (93.2)		
Tinnitus				
Yes	54 (22.6)	14 (8.7)	13.170	0.000*
No	185 (77.4)	147 (91.3)		
Eustachian tube malfunction				
Yes	166 (69.5)	99 (61.5)	2.730	0.098
No	73 (30.5)	62 (38.5)		
Deafness				
Yes	120 (50.2)	40 (24.8)	25.787	0.000*
No	119 (49.8)	121 (75.2)		
Delayed speech				
Yes	15 (6.3)	3 (1.9)	4.359	0.037
No	224 (93.7)	158 (98.1)		
Earache				
Yes	85 (35.6)	53 (32.9)	0.298	0.585
No	154 (64.4)	108 (67.1)		
Tonsillitis				
Yes	10 (4.2)	20 (12.4)	9.411	0.002*
No	229 (95.8)	141 (87.6)		

Considering the sources of bathing, 66 (27.61%) bathed in fresh tube well water, 141 (58.99%) in ponds, 2(0.8%) in canals and 30(12.55%) in river water.

66 (27.61%) previously received treatment from quack, 129 (53.97%) from pharmacist, 44 (18.41%) from registered medical practitioner. Patients taking treatment from pharmacy (p=0.038) were statistically significant with presence of CSOM showed in Table (III).

Table III Patients Hygiene and Treatment profile

Characteristics	Presence of CSOM		Chi square	p value (p)
	Yes n=239 (Percentage)	No n=161 (Percentage)		(χ^2)
History of cleaning ear with				
Cotton bud	100 (41.84)	61 (37.88)		
Feather/vegetable stick/wooden stick	100 (41.84)	73 (45.34)	0.658	0.720
Cloth	39 (16.31)	27 (16.77)		
Source of bathing				
Fresh tube well	66 (27.61)	46 (28.57)		
Pond	141 (58.99)	98 (60.86)	0.719	0.869
Canal	2 (0.83)	1 (0.62)		
River	30 (12.55)	16 (9.93)		
Treatment history from				
Quack	66 (27.61)	45 (27.95)	6.549	0.038*
Registered Medical Physician	44 (18.41)	46 (28.57)		
Pharmacy	129 (53.97)	70 (43.47)		

Regarding the Otoscopic findings, among 239 patients with CSOM, 99 (41.4%) had right sided, 72(30.1%) had left sided, 43 (18%) had bilateral Tubo-tympanic CSOM. 11(4.6%) had right sided, 12 (5%) had left sided and 2 (0.8%) had bilateral Attico-antral CSOM, showed in Figure 1.

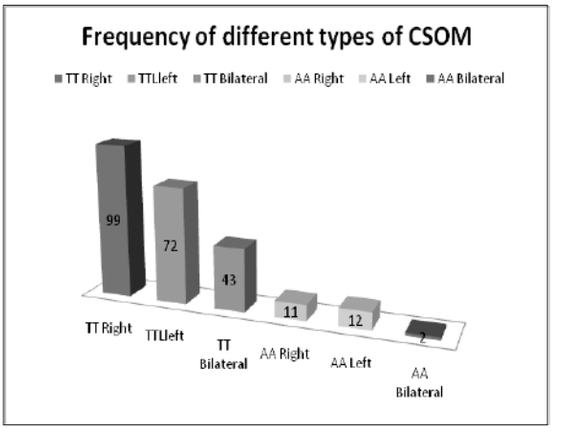

Figure 1 Distribution of different types of CSOM

214 (89.54%) had pars tensa and 25 (10.46%) had pars flacida type of location of perforation. Regarding the size of perforation, 18(7.5%) had tiny, 135 (56.5%) had medium and 86 (36%) had large sized perforation.

215 (89.95%) had presence of discharge with CSOM. Among 215, 104 (48.37%) had thick and 111 (51.62%) had thin discharge. 49/215 (22.79%) had scanty and 166(77.20%) had profuse amount of discharge. 65/215 (30.23%) had foul smelling discharge (Table IV).

Table IV Otoscopic profile of patients of CSOM

Otoscopic findings	Frequency (n) Total=239	Percentage (100%)
Type of CSOM		
Tubotympanic right	99	41.4
Tubotympanic left	72	30.1
Tubotympanic bilateral	43	18.0
Atticoantral right	11	4.6
Atticoantral left	12	5.0
Atticoantral bilateral	2	0.8
Location of perforation		
Pars tensa	214	89.54
Pars flacida	25	10.46
Presence of discharge		
Yes	215	89.96
No	24	10.04
Size of perforation		
Tiny	18	7.5
Medium	135	56.5
Large/ Total	86	36
Consistency of discharge	Frequency(n)	
Total=215	Percentage (100%)	
Thick	104	48.37
Thin	111	51.62
Amount of discharge		
Scanty	49	22.79
Profuse	166	77.20
Smell of discharge		
Foul smell	65	30.23
No smell	150	69.77

Regarding the tuning fork test 102 (42.69%) had positive and 137 (57.33%) had negative Rinne's test. 129 (54%) had centralized and 110(46%) had lateralized Weber test. 230(96.2%) had normal and 9 (3.8%) had reduced Absolute Bone Conduction Test. 217 (90.8%) had normal and 22 (9.2%) had palsied Facial nerve test. 19 (7.9%) had positive and 220 (92.1%) had negative Fistula test (Table V).

Table V Distribution of test results of patients with CSOM

Name of the test	Frequency total (n=239)	Percentage (100%)
Rinne's test		
Positive	102	42.67
Negatve	137	57.33
Weber test		
Centralized	129	54
Lateralized	110	46
Absolute Bone Conduction		
Normal	230	96.2
Reduced	9	3.8
Facial nerve test		
Normal	217	90.8
Palsy	22	9.2
Fistula test		
Positive	19	7.9
Negative	220	92.1

Discussion

CSOM is common manifestation among population of developing countries such as Bangladesh. The findings of this study shall create better awareness among our society to prevent complications of CSOM.

CSOM was prevalent (59.75%) among the different types of Otitis media. The highest rate of CSOM was prevalent in females (64.85%) compared to males (35.14%). Somewhat similar findings were observed in a study in Korea, where female predominance with CSOM was observed compared to male patients.[12]

Patients with age ranging from 0-10 (26.35%) years were affected more with CSOM followed by 21-30 years (21.75%). In a study by Raid M et al. patients with CSOM who were <10 years were 25.5%, followed by >10-19 were 13.7%.[13]

The poor classed (57.74%) patients with CSOM were more compared to middle and high classed. This finding mimics a study done by Kishore HR et al. in India.[14]

Prevalence of CSOM was seen more in families with members more than three due to overcrowding. This finding imitates a study done by Muftah Salem et al, in Yemen.[1]

59.0% of patients with CSOM had a history of bathing in ponds. A study conducted in Narsingdi, Bangladesh by Shaheen MM et al. revealed that those who have habit of bathing in river, pond, canal are prone to CSOM.[15]

41.84% had history of cleaning ear with cotton buds and 41.84% had history of cleaning ear with feathers, vegetable sticks and wooden sticks followed by 16.31% with cloths. In a Nigerian study by Adeyi A A et al. 115/141(81.56%) patients used cotton buds to clean their ears.[16]

53.97% had history of taking treatment from pharmacy, 27.61% from quack and 18.41% from Registered Medical Practitioner. In a study conducted in East Africa by, Nshimirimana JPD et al. 56.9% used traditional medicine to treat CSOM.[17]

Among 239 patients with CSOM, 14.2% of patients had allergic Rhinitis, 25.9% had history of adenoid, 30.1 % had family history of CSOM, 54.8% (p=0.010) had Rhinosinusitis, 41.4% had Deviated nasal septum, 36.8% had Hypertrophy Inferior Turbinate, 4.2% had tonsillitis. In a study by Kishore HR et al. 28.75% had DNS, 11.25% had adenoid, 7.5% had allergic Rhinitis, 1.25% had chronic tonsillitis and 1.25% had acute Rhinitis.[14]

Regarding the ear symptoms 22.6% had tinnitus, 69.5% had Eustachian tube malfunction, 50.2% (p=0.000) had deafness, 6.3% had delayed speech, 35.6% had earache. Salehuddin NSM et al. stated in one of his study that there was significant relation between CSOM and high frequency hearing loss and tinnitus.[18]

77.8% were vaccinated under EPI schedule. Pedrizet J et al. stated that Pneumococcal Conjugate Vaccine (PCV) prevented episodes of Otitis Media which reduced the negative impacts on clinical procedures, economy, humanistic approaches and society.[19]

In the present study, out of 239 patients with CSOM, Tubo-tympanic variety (89.53%) of CSOM was prevalent in comparison to Attico-antral variety (10.46). In a study by Adhikari P et al. similar observation was noted.[4] Considering the location of perforation of Tympanic membrane, 89.53 % had Pars Tensa and 10.46 % had Pars Flacida. In a Nigerian study by Adegbiji et al. 89.8 % had central (38.2% central, 32.3% anterior central, 19.3% posterior central) type of perforation indicating perforation in Pars Tensa.[20]

Out of 239 patients with CSOM, 89.95% of patients with CSOM had a discharge, were 48.37% had thick and 51.62% had thin discharge. A study by Rajput MS et al. revealed that 84/154 had a discharging ear with CSOM.[21]

Out of 215 patients with discharge, 30.23% of patients with CSOM had a foul smelling discharge, 70.69% had an odorless discharge. In contrast in a study by Chirwa M et al. held in Malawi, 76.2% had a foul smelling and 23.8% had an odorless discharge.[22]

Taking into account the size of perforation of Tympanic Membrane, out of 239 patients with CSOM, 56.5% had medium sized followed by 36% large and 7.5% tiny sized. A study by Nagle S et al. revealed small central perforation in 20%, large central in 23% and medium central in 57% of patients.[23]

Facial nerve test revealed palsy in 9.2% of patients with CSOM. In a study by Kim J et al. out of 3435 patients 1.33% had facial nerve paralysis caused by CSOM.[24]

Rinne's test was negative in 57.3%, Weber test was lateralized in 46% and Absolute bone conduction test was reduced in 3.8%. Negative Rinne's test and Lateralized Weber test indicates conductive type of deafness. Reduced Absolute bone conduction indicates, Sensorineural type of deafness. In a study by Muftah S et al. 76.5 % of the patients had conductive type and 8.8% had sensorineural hearing impairment.[1]

Limitations

This study was conducted in only two hospitals of Chattogram. So, the result may not represent the whole picture of CSOM among the Bangladeshi population.

Conclusion

The study conducted in Chattogram indicates a significant frequency of Chronic Suppurative Otitis Media (CSOM). 94.14% of patients reporting symptoms for more than 12 weeks, the illness notably affect younger age groups. The alarming frequency is a result of both inadequate living circumstances and restricted access to healthcare. Targeted therapies are necessary because there are significant correlations between CSOM and age, length of symptoms and other complications due to CSOM i.e. rhinosinusitis and hearing impairment.

Recommendation

Thorough analysis of socio-demographic data, risk factors, clinical manifestations and source of previous treatment history, it highlights the regional burden of CSOM and underscores the necessity of focused interventions. This will draw attention to the worldwide impact of CSOM.

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Contribution of authors

HB- Conception, acquisition of data, drafting & final approval.

HRB- Data analysis, data interpretation, drafting & final approval.

MA- Data analysis, data interpretation, critical revision & final approval

ST- Acquisition of data, drafting & final approval.

RH- Design, critical Revision & final approval.

Disclosure

All the authors declared no competing interest.

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