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Original Article**Risk factors in the complications of Chronic Suppurative Otitis Media**Saiduzaman M^{1*}, Islam MN², Ali MH³

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A prospective study was carried out from July 2015 to July 2017 at the Department of Otolaryngology & Head-Neck Surgery, 250 Bedded Mohammad Ali Hospital, Bogura with the aim to evaluate the risk factors in patients with chronic suppurative otitis media who develop complications. A total of 150 cases of chronic suppurative otitis media, consisting of 75 patients with complications and 75 patients without complications were included in this study. Patients who developed complications were compared with those who did not with respect to six risk factors: age at presentation; sex; socioeconomic condition; duration of ear discharge; type of perforation; and presence of cholesteatoma and or granulation. In the present study extracranial complications occurred in 46 patients (61.33%) and intracranial complications in 29 patients (38.67%). Among the extracranial complication, postauricular abscess (47.83%) was the commonest complication. This was followed by postauricular sinus (30.44%). Meningitis (51.72%) was the most common intracranial complication. Brain abscess (31.03%) was the second most complication. Involvement of middle ear was bilateral in 36.00% of patients with uncomplicated disease and 18.67% in patients with complications. The age of the subjects ranged from 7 to 35 years, with a mean ($\pm$ SD) 19.50 ± 6.64 years in the uncomplicated group ($n=75$). In the complicated group ($n=75$), the age of the patients ranged from 2 to 40 years, with a mean ($\pm$ SD) 15.94 ± 12.92 years. Children (<15 years) formed 60% of patients with complications as compared to 28% of patients without complications. In the uncomplicated group 51 patients were male (68%) and 24 patients were female (32%). In the complicated group male patients were 49 (65.33%) and female patients were 36 (34.67%). The male: female ratio was roughly 2:1 in both groups. The majority (74.67%) of patients with complications were from the lower socioeconomic class. In majority (61.53%) of patients with complications the duration of ear discharge was less than five years. Whereas in most patients (51.00%) without complications the duration of ear discharge was more than five years. Attic perforations ($n=33$) and posterosuperior marginal perforations ($n=20$) were commoner in the complicated cases (70.67%). In the complicated group, cholesteatoma was present only in 28% of cases. The results indicated that patients with complications were younger ($P<0.001$). They had a shorter duration of ear discharge ($P<0.001$). Majority of them had attic or posterosuperior marginal perforations ($P<0.001$) and majority of them were accompanied with cholesteatoma ($P<0.001$). Complications are more prevalent in the lower socioeconomic class ($P<0.001$). The sex involvement was almost similar in both complicated and uncomplicated cases ($P>0.05$).

Key words : Risk factors, Chronic Suppurative Otitis Media.**Introduction**

Chronic suppurative otitis media (CSOM) is a worldwide health problem and is still prevalent in the modern antibiotic era. It is a potentially serious disease because of its complications. The prevalence of CSOM varies between racial and socio-economic group. There is no epidemiological study available about the exact prevalence of CSOM in Bangladesh. But few ENT out patient and ENT camp based studies indicated a high prevalence of the disease¹. Poor living, status poverty, ignorance, low socioeconomic condition, overcrowding and malnutrition have been suggested as a basis for the widespread prevalence of

CSOM in developing countries^{1,2,3}. Complications of suppurative otitis media develop if infection spreads from the middle ear cleft to structures from which this mucosa lined space is usually separated by bone. Factors influencing the spread of infection beyond the middle ear space are²: i) The type and the virulence of the infecting organism; ii) The resistance of the host; and iii) The adequacy of treatment. The clinical symptoms and signs in patients with impending complications are purulent malodorous ear discharge, headache, and fever. Although the total incidence of complications of infectious ear disease has decreased, it is still high in patients suffering from CSOM with

cholesteatoma^{4,5}. Serious intracranial complications most frequently seen during acute exacerbations of chronic suppurative infections associated with cholesteatoma^{6,7,8}. The complications and mortality rate of supportive otitis media have been decreased in the western world but it is still high in the developing countries^{9,10}. Most of our patients come from rural areas, where aural discharge and deafness are probably ignored until complications develop. The problem therefore is to identify at an early stage patients in whom complications are likely to occur and prevent them. So, a comparative study between the complicated and uncomplicated CSOM has been undertaken to identify the risk factors for complication in CSOM.

Aims and Objectives

1. To identify complication of CSOM.
2. To compare the risk factors between complicated and uncomplicated CSOM.
3. To determine the risk factors in patients with CSOM who develop complications.

Materials and Methods

This was a prospective, observational study. This study was carried out in the Department of Otolaryngology & Head-Neck Surgery, 250 Bedded Mohammad Ali Hospital, Bogura From July 2015 to July 2017. One hundred fifty cases of CSOM, out of which 75 patients with complications and 75 patients without complications were included for study. The cases were divided into two groups. The first group was composed of 75 patients, which included uncomplicated CSOM with or without cholesteatoma, and the second group was composed of 75 patients, which included complicated CSOM with either an intracranial or extracranial complications.

Results

Table-I: Age Distribution

Age group (years)	Uncomplicated (n=75)	Complicated (n=75)
0-5	0 (0%)	4 (5.33%)
6-10	8 (10.67%)	20 (26.67%)
11-15	12 (17.34%)	21 (28.00%)
16-20	22 (29.33%)	12 (16.00%)
21-25	19 (25.33%)	9 (12.00%)
26-30	12 (16.00%)	5 (6.67%)
31-35	1 (1.33%)	3 (4.00%)
36-40	0 (0%)	1 (1.33%)

The age of the subjects ranged from 7 to 35 years with a mean $\pm$ SD 19.50 $\pm$ 6.64 years in the uncomplicated group (n=75). In the complicated group (n=75), the age of the subjects ranged from 2 to 40 years, with a mean $\pm$ SD 15.94 $\pm$ 12.92 years (Table-V). 5.33 percent of the cases were under the age of 5 years, 26.67% were between the ages of 6 to 10 years and 28% were between the ages of 10 and 15 years, making a total of 60% children under the age of 15 years in patients with complications. Children (<15 years) formed 28.01% patients in the uncomplicated group.

Table-II : Sex distribution (n=150) No. of Patients (%)

Sex	Uncomplicated (n=75)	Complicated (n=75)
Male	51 (68.00%)	49 (65.33%)
Female	24 (32.00%)	26 (34.67%)

In the complicated group 51 patients were male (68%) and 24 patients were female (32%). In the complicated group male patients were 49 (65.33) and female patients were 26 (34.67%). The male:female ratio was roughly 2:1 in both groups (Table-II).

Table-III. Distribution of complications (n=75)

Complications	No. of Patients	Percentage
Extracranial	46	61.33%
Intracranial	29	38.67%

The distribution of complications (n=75) shows that extracranial complications occurred in 46 patients (61.33%) and intracranial complication occurred in 29 patients (38.67%) (Table-III)

Table-IV. Distribution of extracranial complications (n=46)

Complications	No. of Patients	Percentage
Postauricular abscess	22	47.83%
Postauricular sinus	14	30.44%
Facial nerve palsy	6	13.04%
Bezold's abscess	3	6.50%
Labyrinthitis	1	2.17%

In the extracranial group (n=46), postauricular abscess was the commonest complication (47.83%). This was followed by postauricular sinus (30.44%). Facial paralysis was found in 6 patients (13.04%) (Table-IV).

Table-V. Distrubution of intracranial complications (n=29)

Complication	No. of Patients	Percentage
Meningitis	15	51.72%
Brain abscess	9	34.03%
- temporal	6	
- cerebellar	3	
Lateral sinus thrombosis	2	6.90%
Extradural abscess	2	6.90%
Subdural abscess	1	3.45%

In The intracranial group (n=29), meningitis was the most common complication; occurring in 15 patients (51.72%). Brain abscess was the second most complication (31.03%). Of the 9 cases of Brain abscess, 6 occurs in the temporal lobe and 3 in the cerebellum (Table-V)

Table-VI. Common clinical symptoms and signs of intracranial (IC) and Extracranial (EC) complications.

Clinical Features	ICGroup (n=29)	EC Group (n=46)
Fever	28(96.55%)	17(36.95%)
Headache	26 (89.65%)	12(26.08%)
Neck stiffness	20 (68.96%)	0 (0%)
Otalgia	11 (37.93%)	31(67.39%)
Nausea/Vomiting	17 (58.62%)	5(10.86%)
Facial weakness	1 (3.45%)	6(13.04%)
Vertigo	4 (13.79%)	3(6.52%)
Nystagmus	3 (10.34)	1(3.45%)

Table-VII : Socio-economic condition

Socio-economic Status	Uncomplicated (n=75)	Complication (n=75)
Lower	40 (35.33%)	56 (74.67%)
Middle	26 (34.67%)	15 (20.00%)
Upper	9 (12.00%)	4 (5.33%)

Discussion

Chronic suppurative otitis media (CSOM) with and without complications continues to affect a large number of patients particularly in developing countries^{1,2,3}. The major causes of this problem are neglect and lack of proper medical attention. Many of them have received inadequate or inappropriate medical therapy, which may lead to the development of avoidable complications.

In the present study we have evaluated the risk factors for complications. Patients with complications were compared with patients without complication, in terms of six risk factors: i) Age at presentation; ii) Sex; iii) Socio-economic condition; iv) Duration of ear discharge; v) Type of perforation; and vi) presence of cholesteatoma and / or granulation tissue.

Extracranial complication was found in 61.33% of patients and intracranial complication in 38.67% of patients. This correlates with the study of Kangsanarak et al⁴. In the extracranial group mastoid abscess was the most common complication. This is consistent with the study of Osma et al⁵. Meningitis was the most frequent intracranial complication, brain abscess was the second most common intracranial complication. All brain abscesses are one on the same side as the ear disease. In chotmongkol and sangsaard's study⁶, brain abscess was the most frequent intracranial complication. The temporal lobe is the most frequently involved followed by the cerebellum⁷.

The age of the patients ranged from 7 to 35 years, with a mean $\pm$ SD 19.50 $\pm$ 6.64 years in the uncomplicated group. In the complicated group, the age of the patients ranged from 2 to 40 years, with a mean $\pm$ SD 15.94 $\pm$ 12.92 years. The age at presentation is significantly lower in the group with complications ($P < .001$). Children (<15 Years) formed 60.00% of those patients as compared to 28.01% in the uncomplicated group. The diseases is more aggressive in children probably because of lesser immunity and greater incidence of exposure to upper respiratory infections than adults⁸.

In our study, most of the patients (74.67%) with complications were from the poor socio-economic class ($p < 0.001$). Thia is supported by Samuel et al⁵. The duration of ear discharge was shorter in 61.33% of patients with complications ($p < 0.001$). This correlates with the study done by Glasscok et al⁹. In this series attic and posterosuperior marginal perforations were commoner in patients with complications ($P < 0.001$). This is supported by Ludman¹⁰. Cholesteatoma was found more frequently in patients with complications. This is significantly different from the findings in the uncomplicated group.

Conclusion

From the study it can be concluded that the risk of developing of complications in chronic suppurative otitis media is more when the patients are younger and have a shorter duration of ear discharge. Patients with attic or posterosuperior marginal perforations have higher chance of developing complication. Complications are more prevalent in the lower socio-economic class. The presence of cholesteatoma is major risk factor for complications in chronic suppurative otitis media. The sex involvement of the patients does not appear as a significant factor. Findings of the present study suggest that it is important of identify at an early stage patients in whom complications are likely to occur and consider definitive measures to eradicate the diseases and prevent its complications.

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