

# Pattern of Ossicular Damage in Chronic Suppurative Otitis Media

1. Faheem Ahmed Khan 2. Ayub Musani 3. Itrat Jawaid 4. Wadood-ul-Hasnain

5. Asif Abbasi

1. Sen. Registrar of ENT, KM&DC, Karachi 2. Assoc. Prof. of ENT, KM&DC, Karachi 3. Asstt. Prof. of ENT, KM&DC, Karachi 4. Sen. Registrar of ENT, Abbasi Shaheed Hospital, Karachi 5. Consultant of ENT, Abbasi Shaheed Hospital, Karachi.

## ABSTRACT

**Objective:** The aim of this study is to determine pattern of ossicular damage in chronic suppurative otitis media.

**Study design:** Prospective Study.

**Place and Duration of Study:** This study and was conducted in Karachi and Medical and Dental College and Abbasi Shaheed Hospital during the period of October 2006 to October 2010.

**Patients and Methods:** 288 patients were selected in this study and intra-operative findings of ossicles were noted.

**Results:** Total number of patients was 288, in which female was slight domination with 54.1%. Maximum incidence was noted between the ages of 16-30 years of age which was 180 patients. 209 patients presented with central perforation. 140 cases had no ossicles damage while 148 cases had one or more ossicles damage. **Conclusion:** Chronic suppurative otitis media may cause no ossicular damage of ossicles damage. Ossicles damage can be prevented by early diagnosis and proper management.

**Key Words:** Chronic suppurative otitis media, Ear discharge, Ossicular damage.

## INTRODUCTION

Otitis media is an inflammation of the middle ear<sup>1</sup>. Otitis media is three types, Acute, Subacute and Chronic suppurative otitis media. Chronic suppurative otitis media is the long standing infection of the middle ear cleft and characterized by discharging ear and permanent perforation<sup>2</sup>. Chronic otitis media is one of the common ear diseases in south east Asia having a prevalence of approximately 5.2% in the general population<sup>3</sup>. Frequent upper respiratory infection, poor socio-economic condition (overcrowded housing)<sup>4</sup>, poor hygiene and nutritional deficiency all may cause chronic suppurative otitis media<sup>5, 6</sup>.

Chronic suppurative otitis media (CSOM) clinically divided into, 1) Tubotympanic type, which is also called safe or benign type and 2) Attico-antral type which is also called unsafe or dangerous type. Risk of complication is more in latter type<sup>7</sup>. Pathologically, divided in to 1) healed otitis media, 2) Inactive (mucosal) chronic otitis media, 3) active (mucosal) chronic otitis media, 4) Active squamous epithelial otitis media 5) Inactive squamous epithelial otitis media. In many developing countries, CSOM is the most frequent cause of moderate hearing loss (40-60 db)<sup>8</sup>. Ossicular damage is one of the sequel of prolong discharge from the ear. It may present in both cholesteatoma and non-cholesteatomatos types of chronic suppurative otitis media<sup>9</sup>. Ossicles damage this disease due to 1) Squamous epithelium, which penetrates of the Haversion system of the ossicles and causes avascular necrosis of the bone, 2) Inflammatory exudates which contain proteases, collagenases and 3) Rim of granulation tissue which surrounds the

cholesteatoma<sup>10</sup>. The aim of this study was to determine the status of ossicles in chronic suppurative otitis media.

## PATIENTS AND METHODS

This prospective study was conducted in ENT department of Karachi Medical and Dental college and Abbasi Shaheed hospital during the period from October 2006 to October 2010. During this period, all the patients who came in ENT department of Abbasi Shaheed hospital with the ear discharge proper history taken and complete examination were done and recorded in predesigned proforma. Culture and sensitivity of the pus were carried out. All relevant investigations were done. X-ray mastoid was also carried out and where required C-T scan was done. Before surgery, Pure tone audiometer and Speech audiometry was done. Intra-operative finding of ossicles were noted. During this period, 309 patients with chronic suppurative otitis media (CSOM) admitted in the ENT ward in which 288 undergone surgery included in this study while 21 patients excluded from the study due to revision ear surgery or not fit for the surgery.

**Inclusion Criteria:** History of ear discharge three months or more

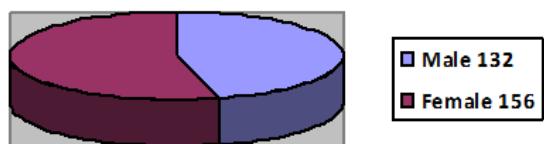
**Exclusion Criteria:**

- Revision ear surgery.
- Not fit for surgery due to medical reason.

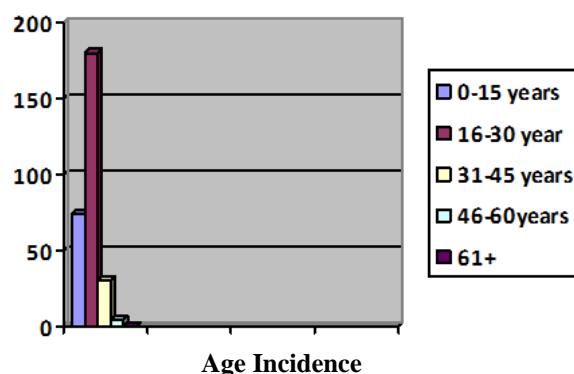
## RESULTS

Total number of patients in this study was 288. Female was slight domination with 156 cases (54.1%). Female

male ratio was 1.18:1. Maximum incidence of age was between 16-30 years which was 180 cases followed by between 0-15 years of age which was 74 cases. Central perforation was found in 209 cases. In 140 cases, all ossicles were intact. Multi-ossicles damage was Malleus and Incus which was 56 cases. Single most frequent ossicle damage was Malleus, in 46 patients.



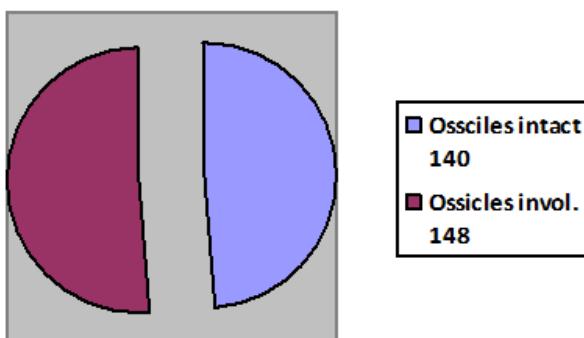
**Pie Chart: Male and Female**



#### Perforation:

Central perforation: 209, 72.5%

Marginal perforation: 79, 27.4%



**Ossicles Involvement**

**Table: Ossicles Involved**

Absent Malleus	Absent Incus	Both malleus and Incus	Malleus, incus with suprastructure of stapes	Malleus, Incus with stapes
46	28	56	12	6

## DISCUSSION

Chronic suppurative otitis media(CSOM) is defined as “Persistent or intermittent ear discharge from non-intact tympanic membrane for more than three months”. Chronic suppurative otitis media may cause permanent damage to the ear, mastoid pathologies and extra-cranial complications<sup>11</sup> The world wide prevalence of

CSOM is 65 to 330 million people, and 39 to 200 million (60%) suffer from clinically having impairment<sup>12</sup>. In middle ear, intact ossicles are very essential to conduct the sound from external ear to inner ear. Howard (2007) stated that conductive hearing loss occur due to impairment of sound impulses before they enter the inner ear<sup>13</sup>. Hearing loss is reported in about 50% of cases of CSOM<sup>14</sup>.

In the study, female was slight more, 54.1% as compared to male, 45.8%. Female male ratio was 1.18:1. One study also showed domination of disease in female 53% and 47% in male<sup>15</sup>. Salam et.al study also showed 60% involvement of female<sup>16</sup>. On the other hand Vanderveen et.al showed no differences between sexes in patients of CSOM<sup>17</sup>, Maximum incidence of CSOM noted in young age group between the age of 16-30 years of age which was 62.5% followed by 0-15 years of age which was 25.6%. According to Shafiq Islam et.al study showed highest number of patient was in the group of 21-30 years of age<sup>18</sup>. The pattern of tympanic membrane perforation was Central in 72.5% cases and marginal 27.4%. Study showed central perforation was more 92% as compared to marginal perforation<sup>15</sup>. In intra-operative findings of ossicles 48.6% had all the three ossicles were intact and mobile and 51.3% patients found one or multi-ossicles damage due to the disease. Marfani et.al study showed 30% patients had mobile and intact ossicles<sup>10</sup>. In ossicles damaged, the frequent multi-ossicle involvement is Malleus and Incus, in 56 patients followed by Malleus, Incus and Suprastructure of stapes.. The most frequent single ossicle involvement is malleus 46 cases followed by incus which was 14 cases. Different study showed that long process of Incus is frequently involved due to the disease<sup>19, 20</sup>. But in our study, frequent single ossicle involved is malleus and this is may be due to the prolong tympanic membrane perforation which leaves the handle of malleus exposed<sup>10</sup>.

## CONCLUSION

Chronic suppurative otitis media is the common disease in Southeast Asia. Damage of ossicles may cause conductive hearing loss. Multi-ossicular and single ossicle both were involved. Ossicles damage and complications can be prevented by early diagnosis and proper management of the disease.

## REFERENCES

1. Ahmed M. Alabbasi, Ihsan E. Alsaimary, Jassim M Najim. Prevalence and patterns of Chronic suppurative otitis media and hearing impairment in Basrah city. Journal of Medicine and Medical sciences 2010;1(4):129-133.
2. Colman Diseases of the nose, throat and ear and head and neck. 14<sup>th</sup> ed. UK: Churchill Livingstone; 1992.p.231.

3. Uddin W, Hussain A, Khan A, Ahmad F, Samiullah. Prevalence and Comparison of Chronic Suppurative Otitis Media in Government and Private Schools. Ann Pak Inst Med Sci 2009;5(3): 141-144.
4. Homeo P. Otitis media in Greenland. Studies on historical, epidemiology, microbiological, and immunological aspects. Int J Circumpolar Health 2001; 60 (Supp 2): 1-54.
5. Tos M. Sequelae otitis media and the relationship to chronic suppurative otitis media. Ann Otol Rhinol Laryngol 1990;99:18-19.
6. Daly KA, Hunter LL, Levine SC, et al. Relationships between otitis media sequelae and age. Laryngoscope 1998; 108: 1306-1310.
7. Harkness P, Topham J. Classification of otitis media Laryngoscope 1998;108:1539-1593.
8. Muya EW, Owino O. Special education in Africa: research abstracts Nairobi. UNESCO 1986.
9. Amjad M, Nasim A. Incidence of cholesteatoma in various age, sex and socioeconomic groups. Ann king Ewdard Med Coll 1998; 4(4):65-6.
10. Marfani MS, Maggi PB, Thaheem K. Ossicular damage in chronic suppurative otitis media- study of 100 cases. Pak J Otolaryngol 2005;21:09-11.
11. Yasmeen T, Farhan E, Shahana U. Pathological Analysis of 596 cases of Chronic Suppurative Otitis media in Karachi. J Coll Physicians Surg Pak 2000;10(1):33-5.
12. WHO. Chronic suppurative otitis media. Burden of illness and management options. 2004. [http://www.who.int/child-adolescent-health/New-Publication/Child\\_Health\\_ISBN\\_92\\_4\\_1598\\_7.pdf](http://www.who.int/child-adolescent-health/New-Publication/Child_Health_ISBN_92_4_1598_7.pdf) (last accessed 8 November 2005).
13. Howard D. Intercultural cumunication and conductive hearing loss. J First peoples child Fam Rev 2007;3(4):97.
14. Lasisi AO, Sulaiman OA, Afolabi OA. Socio-economical status and hearing loss in Chronic Suppurative Otitis media in Nigeria. Ann Trop Paediatr 2007;27(4): 291-6.
15. Demon MA, Thaheem KU, Marfani MS. Frequency and complications of Cholesteatoma in patients with chronic suppurative otitis media. Pak J Otolaryngol Dec 2005;21(3):48-9
16. Salam A, Abid SH, Abdullah EM. Suppurative otitis media in Karachi in 510 cases. Pakistan Journal of Otolaryngology 1997;13:66
17. Venderveen EL et.al. Predictors of chronic suppurative otitis media in children. Arch, Otolaryngol. Head and Neck Surg 132(10):1115-1118.
18. Shafiqul M, et al. Pattern and degree of hearing loss in chronic suppurative otitis media. Bangladesh J Otorhinolaryngol 2010;16(2):96-105.
19. Zafar I, Kashif I, Zubair I. Ossicular damage in attico antral variant. Professional Med J 2009; 16 (3): 414-8.
20. Whrs RE. Ossicular reconstruction in ear with cholesteatoma. The Otolaryngologic clinics of North America 1998:tololaryngologic clinics of North America 1998;22:1006.

**Address for Corresponding Author:**

**Dr. Faheem Ahmed Khan**  
C-49, Block A, North Nazimabad,  
Karachi, 74700, Pakistan  
Cell No.0300-2148912