

## C.S.O.M. : A BACTERIOLOGICAL STUDY

M. K. Taneja

### ABSTRACT

654 patients with C.S.O.M. were subjected to bacteriological evaluation including anaerobic studies. A total 736 samples were assessed. This study suggests that *Staphylococcus aureus* (30.7%), *Betahaemolytic streptococcus* (26%) and *Pseudomonas aeruginosa* (16%), *E. coli* (10.6%) and *Klebsiella* species (7%) were the significant causative organisms in chronic suppurative otitis media (C.S.O.M.) with a predominance of *Betahaemolytic streptococcus* in children with C.S.O.M.  
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Chronic suppurative otitis media is one of the commonest illnesses in E.N.T. practice which requires medical attention all the more in children of poor socio-economic status having in past inadequate treatment and negligent medical care. Chronic otitis media is a destructive, persistent disease with irreversible sequelae. Micro-organisms reach middle ear by passing through the lumen of eustachian tube from nasopharynx or by spreading in

to describe the suppuration in ear as primary lesion. Audina and Alleman (1950) started their work on importance of testing the resistance of pathogenic bacteria and their sensitivity.

### Materials and Methods

The work presented in this series was carried out during the years 1992 through 1995. A total of 736 samples were collected from 654 patients. All the patients were of out

Presenting Symptoms	No. of Cases	Percent
Discharge	654	100%
Itching	113	17.27%
Pain	61	9.32%
Loss of Hearing	46	7.03%
Post Aural Swelling	11	1.68%
Post Aural Sinus	8	1.22%

Table I : Presenting Symptoms in 654 cases of C.S.O.M.

the lamina propria of the mucosa as an extending cellulitis or thrombophlebitis.

The changing bacterial flora with widespread use of antimicrobials often leading to multiple resistant strain of bacteria in the last decade have prompted us to further study which will presumably fascinate the practicing ENT specialist.

**Historical Aspect** - Morgagni was the first

From : Indian Institutes of Ear Diseases, Muzaffarnagar-251 001 India, Reprints - M.K. Taneja

patient department of Indian Institute of Ear Diseases, Muzaffarnagar with presenting symptoms shown in Table I. 96 post-operative patients were also included attending OPD as discharging ear, operated at various centres including ours. Out of 654 patients 439 were children and 215 were adults. 28% were female. The predominant physical signs of chronic infection are shown in Table III. After a preliminary examination for smell, gram's staining for morphological character-

Age (in Years)	Male		Female		Patients	
	Number	Percent	Number	Percent	Number	Percent
0-15	334	71.06	105	57.06	439	67.12
16-30	65	13.82	27	14.67	92	14.06
31-45	46	9.78	27	14.67	73	11.14
46-60	20	4.25	24	13.04	44	6.72
61 and above	5	1.06	1	.54	6	.91
Total	470		184		654	

Table II : Showing Age and Sex Distribution among Cases of C.S.O.M. Studied

istics was done. The material was collected with utmost precaution by a specially prepared thin sterile swab avoiding touch to canal, and it was cultured on blood agar, MacConkeys agar and blood agar containing 60 µg/ml Neomycin and Metronidazol 5 µg/disc for anaerobic jars.

### Results

The bacteriological findings are listed in Table IV. Altogether 76 bacteria were isolated : 68 aerobic or facultative aerobic and 8 anaerobic. Culture was sterile in 16% cases. It may be due to interrupted electricity supply even in the best centres and inadequate anaerobic culture facilities in private pathological laboratories.

Monobacterial infection was observed in 80.7% cases and polybacterial in 3.3% cases. *E. coli* was the second main offender in post operative cases.

In children most common bacteria were

*Betahaemolytic streptococci*, the *Staphylococcus aureus*. *Pseudomonas* were next. In the adult group *Pseudomonas aeruginosa* and *P. pyocyaneus* were main offenders. In post-operative cases *Staph. aureus* was the most common offender, anaerobes were isolated in cholesteatoma patients.

### Discussion

The study of bacteriology and drug sensitivity is necessary to enable the treating family physician to plan the general management of C.S.O.M. and it is almost essential for the E.N.T. surgeon to make the discharging ear (tubotympanic type) dry for better results of myringoplasty and ossiculoplasty.

Monobacterial infection was observed in 80.7% cases while Ayyagari et al. found it in 50.5% cases and Rao et al. in 68.52% cases. In our series the children were affected more.

Type of discharge	No. of Cases	Percent
Mucoid	176	26.91
Mucopurulent	306	46.78
Purulent	172	26.29
Odour less	593	90.67
Foul Smelling	61	9.32

Table III : Showing Characteristics of the Discharge

Organisms	Percentage showing growth	Total organisms isolated
Monomicrobials	80.7%	594
Polymicrobials	3.3%	24
No organism	16%	118
Total	100%	736
Aerobic	80.6%	593
Anaerobic	3.4%	25
No organism	16%	118
Total	100%	736

Table IV : Bacteria Isolated from 736 Samples

Males were affected most according to Ayyagari (63%) and Rao (44%) and also in this series. In children most common bacteria were *Betahaemolytic streptococci*, *Staphylococcus aureus*, *Pseudomonas* and *Streptococcus pneumoniae*. *Haemaphysilus influenzae* and *Streptococcus pneumoniae* were to be the commonest infecting organisms in C.S.O.M.

amongst infants and children from Japan. Ayyagari et al. have reported *Betahaemolytic streptococci* and *streptococcus pneumoniae*. In the adults *Staphylococcus aureus* was the main offender which is consistent with Rao et al.

*Pseudomonas* comes next in the list while Ayyagari et al. observed it as the main

	No.	%	No.	%
<i>Gram Positive:</i>			365	58.9%
Staphylococcus aureus	190	30.7%		
Betahaemolytic streptococci	161	26%		
Streptococcus pneumoniae	8	1.3%		
Streptococcus viridans	6	1%		
<i>Gram Negative</i>			228	37.1%
Pseudomonas aeruginosa	99	16%		
Proteus	21	3.4%		
Esch. coli	65	10.6%		
Klebsiella species	43	7%		
<i>Anaerobes</i>	25	4%	25	4%

Table V : Organisms Isolated from Ear Discharge

offender. Nene et al. observed *Pseudomonas proteus* followed by *Klebsiella* and *Staphylococci*. The bacterial flora in the present series is more or less in corroboration with the series from the Western world. It is the invasive property of *Staphylococcus aureus*, which is responsible for the largest number of cases as in the present series, or they may be second to *Pseudomonas* species. The resistant strains are now not uncommon in India on account of widespread use or abuse of antibiotics in the remote corners of population.

In the present series the drugs of choice were Cefataxime, Amikacin, Norfloxacin, Netilmycin, and Gentamycin but on clinical trials cost effective treatment in OPD by Norfloxacin 2 mg/kg with 20 mg/kg Metronidazole gave the best results, Post-operative

cases, where the culture was sterile or resistant to all antibiotics, responded best to Local Povidone iodine drops and repeated cauterization of granulations and dressings with mixed cream of antibiotic and antifungal agents.

### Conclusion

Culture and sensitivity should be done in all cases and treatment should be given for sufficient length of time. Norfloxacin, Metronidazole, Gentamycin are the economical drugs and should be kept in first line of the management empirically. Cefataxime, Amikacin and Netilmycin should be given after culture and sensitivity. Topical Povidone iodine solution as drops needs a further evaluation to establish it as eardrop specially in resistant *Staphylococcus aureus* cases or in post operative discharging ears where middle ear is sealed by graft.

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