COMPARATIVE STUDY OF BACTERIOLOGICAL PATTERN & DRUG RESISTANCE IN ASOM & CSOM

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ABSTRACT: AIMS & OBJECTIVE: Comparative study of bacteriological pattern of ASOM & CSOM & their drug sensitivity pattern. **MATERIAL & METHODS:** Aural pus swab (after taking all aseptic precautions) was taken from patients having clinical signs and symptoms of ASOM & CSOM & sent for culture (aerobic & anaerobic) & drugs sensitivity pattern to laboratory. **RESULT:** In the present study we have found In ASOM, streptococcus pneumoniae is found in 31.2%, staphylococcus 27%, E coli 18%, and sterile 18% of cases. In CSOM, staphylococcus is found in 37%, pseudomonas 24%, E coli 14%, streptococcus 12%. of cases. Among all drugs studied – Cephalosporins, Amikacin & Norfloxacin are found more sensitive. In majority of cases multi drug resistance is found. In patients with cholesteatoma, staphylococcus aureus & pseudomonas was found. **CONCLUSION:** Present observation indicates that: In ASOM cases, Streptococcus pneumoniae is found as most common bacteria followed by staphylococcus aureus and E coli. In CSOM cases staphylococcus aureus is found most common pathogen followed by pseudomonas. Among all studied drugs, Amikacin, Gentamicin, Norfloxacin & Cephalosporins (gen III & IV) were found most effective.

Key Words: ASOM, CSOM, streptococcus pneumonia, staphylococcus aureus, Multi drug resistance.

Introduction: Otitis Media is a multifactorial disease involving microbiological organisms, environmental risk factors & host characteristics. (Chandrasekhar MR, Krishna BVS 2004). Ref⁽¹⁾ OM is defined as an inflammation of the middle ear cleft without reference (specific) etiology and pathogenesis the middle ear cleft consist of the tympanic cavity (tympanum), the Eustachian tube and the mastoid air all system.

Otitis media can be classified as

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- Tubercular OM
- Syphilitic OM

Hippocrates: Acute pain of the ear with continued strong fever is to be dreaded, for there is danger that man becomes delirious and die. The term suppurative otitis media means a purulent inflammation of the middle ear cleft. It implies the presence of pus and in its original use indicated that the ear was making or discharging pus. The cause is often purely infective but other agents such as allergy, cholesteatoma, chemical irritants, auto-immune disease and others may underlie the discharge.

It is necessary to establish as to whether it is viral or bacterial in nature viral AOM is usually a consequence of upper respiratory virus i.e. rhinovirus, respiratory Syncytial virus which present as congestion and middle ear fluid accumulation.

Fluid may persist even for months leading to deafness. While bacterial infection present with Signs and symptoms of acute inflammation, pain in ear, congestion and bulging of tympanic membrane. White, yellow or turbid fluid behind it may be associated with malaise and mild pyrexia. Acute otitis media is usually a result of migration of nasopharyngeal bacterial flora into the middle ear through Eustachian tube.

Bacteriologically as well as etiologically both types are different due to prevalence of multiple pathogens. Because of indiscriminate use of antibiotic the bacteriological scenario has changed.

25 to 35% of children will have suffered one or more attacks before 7 years of age. Abnormal function of the Eustachian tube appears to be the most important factors in the pathogenesis of the middle ear disease.

Some recent studies show the predominant involvement of one side than bilateral involvement.

Majority of patients complains of discharge from either from a Single ear or both ears. Pain is the next common symptom followed by ear-itching, loss of hearing and tinnitus. In the present study, an attempt is made to study the incidence of otitis media and their anti microbial sensitivity pattern for anti microbial agents.

METHODS: The present study is carried out at department of ENT, Netaji Subhash Chandra Bose, Medical College & Hospital, Jabalpur from July 2004 to June 2005 and involve 100 patient attending ENT outpatient department of age of 3-14 year of age presented with clinical symptoms & signs of otitis media. Patients with otitis externa and referred otalgia were excluded.

The ear showing the discharge were thoroughly cleaned externally with saline & disinfected with spirit before taking swab from the meatus. Aural swab were then sent to pathology test. Other investigation like X-ray mastoid oblique view, CBP ESR urine examination & Pure Tone Audiometry were also carried out.

RESULT: Males are more affected then female (1.32:1). Ear discharge (Rt>Lt) followed by hearing impairment were the most common presenting complaint.

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In ASOM streptococcus is the most common causative organism cultured followed by staphylococcus and E coli. Most of the patient present with mild & moderate conductive hearing loss and most of patient have pneumatized mastoid.

In CSOM staphylococcus aureus & pseudomonas are most common & most of patients present with moderate conductive hearing loss & most of patient have sclerosed mastoid. Most of pathogenic organism develops multi resistance against antimicrobial drugs.

Amikacin, Gentamycin, cephalosporin group III & IV & ciprofloxacin were the most effective drugs.

DISCUSSION: The present study includes 100 cases of OM in one year duration.

Out of 100 studies cases 57% were male and 41% were female giving a male: female ratio of 1.32:1. This shows that males were more affected than female *as found by Vijaya D (62.77% M) 1998, Parveen Naheed (62.03%) 2002, Gulati et al (61% M) 1997. Ref ^(11, 8, 21) (Table No. I). In the present study majority of patients (65%) were from poor socioeconomic group (31%) from middle socioeconomic group and (4%) were from upper socioeconomic group Gulati 1997. Ref ⁽²¹⁾ ASOM was found in 23 cases (4Lt 19Rt) *as found by Lalwani & Scoy (1992), Robbins Schneerson & Szu (1988) De Moria et al (1984). Ref ^(10, 2, 5, 6) (Table No. II & III) CSOM was found in 78 cases (47 safe, 31 unsafe) 22Left and 31Right sided.

In our study ear discharge was the most common presenting symptoms (in $\geq 95\%$), hearing loss (61%), cough & cold* as found by Rao BN, Reddy MS (1991), Gulati et al (1997) Reddy Venugopal (1998). Ref ^(24,16,21) (Table No. IV). In 37% cases of CSOM – staph aureus, 24% - pseudomonas, * as found by Chandra shekhar 2004, Vijaya Das (2000) Alanazi et al (1998). Ref ^(1, 11, 14) In ASOM 70% - streptococcus pneumonia, 27% - staph aureus as found by Nwawolo cc 2001, Maruyama J 1996. (Table No.V). In patient having cholesteatoma – 46% have shown staphylococcus aureus *as found by Gupta Vinita et al (1998), Rao BN & Reddy 1994, Karma P 1998. Ref^(18,24,40) 30.8% - pseudomonas, 77% proteus & streptococcus in 7% agent. (Table No. VI).

Present study show that most of bacteria show resistance to 3 or more antimicrobial agent. Cephalosporin group of drugs are least resistant group & effective against most bacteria cultured from aural swab *as found by Brook I 2004, Go K U Bulut Y 2001, Nyembwe DT Alanazi et al 1998, Vijaya D 2000 Varshenoy et al 1999 Ref ^(33,14) followed by Amikacin, Gentamycin and Ciprofloxacin. Most of cultured organisms shows (Parveen Naheed 2000) Ref ⁽⁸⁾ resistance against ampicillin clindamycin amoxicillin and norfloxacin group of drug. (Table No. VII & VIII).

Statistical cross-relation of bacteriological study of aural discharge with throat swab was done to check the control of study results. (Table No. IX).

In the study of 78 cases of CSOM child ofloxacin was susceptible on all pathogenic bacteria & neomycin 96% and Gentamycin 83% susceptibility was found *as found by Vijaya D (2000), Varshenoy et al (1999) Ref⁽¹¹⁾

Most of pathogen were resistant to amoxicillin*as found by Parveen Naheed (2000) Ref⁽⁸⁾.

The results of present study are in well accordance with various authors in previous studies. (Table No. X).

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CONCLUSION: Present observation indicates that:

In ASOM cases, Streptococcus pneumoniae is found as most common bacteria followed by staphylococcus aureus and E coli.

In CSOM cases staphylococcus aureus is found most common pathogen followed by pseudomonas.

Among all studied drugs, Amikacin, Gentamicin, Norfloxacin & Cephalosporins (gen III & IV) were found most effective.

Age (in years)	Male (%)	Female (%)	Total
0 - 3	6 (10.5)	1 (2.3)	7 (7.0)
3 - 6	7 (12.3)	8 (18.6)	18 (15.0)
6 - 9	10 (17.5)	10 (23.3)	20 (20.0)
9 - 12	26 (45.6)	16 (37.2)	42 (42.0)
12 - 14	8 (14.0)	8 (18.6)	16 (16.0)
Total	57	43	100
Mean ±SD	9.16 ±3.36	9.56 ±3.24	9.33 ±3.30

Z = 0.60 ; P > 0.05

Table 1: Age and sex wise distribution of the studied cases

Symptoms	No of Cases	Percentage
Discharge	95	95
Hearing loss	56	56
Cough & Cold	43	43
Ear ache	8	8
Tinnitus	8	8
Ear fullness	5	5
Headache	3	3
Vertigo	1	1
Fever	1	1

Table 2: Study of presenting symptoms of otitis media

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	Frequency	Percentage	Total %
AOM (Rt.)	4	4.0	4
ASOM (Lt.)	4	4.0	19
ASOM (Rt.)	9	9.0	
ASOM (Rt.) + AOM (Lt.)	1	1.0	
ASOM B/L	5	5.0	
CSOM (B/L) Safe	22	22.0	46
CSOM (Rt.) Safe	13	13.0	
CSOM Safe (Lt.)	11	11.0	
CSOM Unsafe (Rt.)	18	18.0	31
CSOM (B/L) Unsafe	2	2.0	
CSOM (Lt.) Unsafe	11	11.0	
Total	100	100.0	

Table 3: Incidence of various types of otitis media in co-relation on with laterality

Symptoms	No of Cases	Percentage
Discharge	95	95
Hearing loss	56	56
Cough & Cold	43	43
Ear ache	8	8
Tinnitus	8	8
Earfullness	5	5
Headache	3	3
Vertigo	1	1
Fever	1	1

Table 4: Study of presenting symptoms of otitis media

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Bacteria	ASOM	CSOM	Total Frequency	Percent
Proteus	0	3	3	3.0
Aspergillus	1	2	3	3.0
E. Coli	4	11	15	15.0
Klebsiella	0	1	1	1.0
Pseudo	0	19	19	19.0
Staph. Aureus	6	29	35	35.0
Sterile	4	4	8	8.0
Strepto P	7	9	16	16.0
Total	22	78	100	100.0

Table 5: Bacteriological study of Aural swab in studied cases

Aural swab Culture	CHOLESTEATOMA		Total
	Present	Absent	
B Proteus	1	2	3
	7.7%	2.3%	3.0%
E. Coli	1	14	15
	7.7%	16.1%	15.0%
Klebsiella	0	1	1
	.0%	1.1%	1.0%
Pseudomonas	4	15	19
	30.8%	17.2%	19.0%
Staph. Aureus	6	29	35
	46.2%	33.3%	35.0
Streptococcus Pneumoniae	1	15	16
	7.7%	17.2%	16.0%
Sterile	0	11	11
	.0%	12.6%	11.0%
Total	13	87	100

Table 6: Study of Aural swab Culture in cholesteatoma positive cases

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Bacteria	Ampicillin	Gentamycin	Clindamycin	Azithromycin	Septran	Ciprofloxacin	Cephalosporin	Amikacin	Norfloxacine	Amoxicillin
Strepto P	11	13	10	14	12	12	12	16	8	13
Staph A	14	25	28	29	26	28	34	32	15	09
Pseudo	4	10	8	11	5	14	18	17	8	11
Klebsiella	0	1	1	1	1	1	1	1	1	1
Proteus	3	2	1	1	2	3	3	3	2	1
E coli	11	7	8	8	9	11	15	15	11	10
Total	43	58	56	64	55	69	83	84	45	45

Table 7: Antibiotics sensitivity pattern of the bacteria isolated from aural discharge of ASOM cases

Bacteria	Ampicillin	Gentamycin	Clindamycin	Azithromycin	Septran	Ciprofloxacin	Cephalosporin	Amikacin	Norfloxacine	Amoxicillin
Strepto P	6	8	6	7	6	6	8	9	5	6
Staph A	13	18	23	24	22	22	28	26	14	18
Pseudo	4	11	8	12	6	15	18	17	10	4
Klebsiella	1	1	1	1	1	1	1	1	1	1
Proteus	3	2	1	1	2	3	3	3	2	1
E coli	8	5	6	5	7	8	11	11	8	8
Total	35	45	45	50	44	55	69	67	40	38

Table 8: Antibiotics sensitivity pattern of the bacteria isolated from aural discharge of CSOM cases

		Throat swab		Total
		Positive	Negative	
Aural swab	Positive	60	89	149
	Negative	40	11	51
	Total	100	100	200
Mean $\pm$ SD =		9.16 $\pm$ 3.36	9.56 $\pm$ 3.24	9.33 $\pm$ 3.30

$$X^2 = 22.13; P < 0.0001$$

Table 9: Statistical cross-relation of bacteriological study of Aural discharge with throat swab

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	Present study	Vijaya D 2000	Parveen Naheed 2002	Rao & Reddy 1994	Gulati 1997	Al. Anazi et al 1998	Nagarat Hnammat 1998	Chandra shekhar 2004	Ibekwe Ao et al. 1983
	%	%	%	%	%	%	%	%	%
St. pn.	16	3	26	5.83					
Staph A	35	36.23	10	42.50	16.6	25.71	19.90	17.98	20.7
Pseudo	19	19.72	15	21.60	41	25.71	7.28	46.76	22.5
E. Coli	15	0.91	4.2	10.83	15.6				
Kleb.	1	10.55	3	10	16	2.35	18.44	12.23	2.7
Aspergi	3			7.5	10	17.14	10.19		17.1
Proteus	3	6.41	4	18	5.6	5.88	3.88		3.6

Table 10: Statistical co-relation of present study with previous authors

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