

THE DISCHARGING EARS IN ADULTS IN IBADAN, NIGERIA CAUSATIVE AGENTS AND ANTIMICROBIAL SENSITIVITY PATTERN

¹Oni A.A., ²Nwaorgu O.G.B., ¹Bakare R.A., ¹Ogunkunle M.O., ¹Toki R.A.

¹Department of Medical Microbiology and ²Otorhinolaryngology University College Hospital, Ibadan, Nigeria.

In an attempt to study the microbiology of discharging ears, ear swabs were taken from 347 adult patient with discharging ears in the University College Hospital, Ibadan between March 1995 and February 1997. The presumptive diagnosis and indication for ear swabbing were chronic suppurative otitis media (67.1%), acute suppurative otitis media (14.4%) and otitis externa (18.2%). Using standard microbiological methods, 82.4% of the patients had microbes in their ears. These were identified as Pseudomonas aeruginosa (34.6%), Staphylococcus aureus (19.4%), Klebsiella species (17.4%) and Proteus species (12.5%). Others were Candida albicans and Aspergillus species.

Susceptibility result showed that ceftazidime, azithromycin, ceftriaxone, cefuroxime and gentamicin were active against majority of the bacterial isolates and are therefore recommended as first line drugs, while the quinolones should be kept as reserve drugs in the management of these conditions. In addition antifungal cream should be used as wick in dressing, as well as systemic metronidazole to take care of the anaerobes.

INTRODUCTION

The discharging ear is a very common problem in the tropics. It is seen in all age groups but most prevalent in infants and children. Its decreasing incidence during and after adolescence is a result of the growth and development of the pharynx. Yet it is still one of the major problems of adults attending the Ear, Nose and Throat (ENT) clinics.

A discharging from the ear may arise from the external auditory meatus in otitis externa, or from the middle ear cavity in otitis media. There is very scanty information on the epidemiology of otitis externa, otitis media and otomycosis in the developing countries. In an attempt to further compliment the search for the most economically available antimicrobial agents which will prevent long term otological, audiological and neurological consequences, we studied the cases of adults presenting with discharging ears to the University College Hospital (UCH), Ibadan from March 1995 to February 1997.

PATIENTS AND METHODS

Adult patients presenting with discharging ears to the UCH between March 1995 and February 1997, whose ear swabs were sent for microbiological studies in the department of Medical Microbiology were recruited into the study. Routinely, each ear swab was inoculated onto blood, chocolate and MacConkey agars. Both the blood and chocolate agars were incubated in candle extinction jar (microaerophilic), while the MacConkey agars were incubated aerobically at 37°C overnight. The isolates were identified to species level by standard microbiology methods and their antimicrobial sensitivities done by using Stoke's disc diffusion techniques.

RESULTS

During the study period, swabs were received from 347 consecutive patients. Of these, 304 (87.6%) were outpatients while 43 (12.4%) were inpatients. 270 of the outpatients (88.8%) were from the ENT clinic and 14 (32.5%) of the in-patients were from the ENT wards. The distribution of age, sex and side of

discharging ear overshown in table 1. The male to female ratio was 1:0.98. The side of ear discharge was not specified in 24.5% of these patients while 30.2%, 29.7% and 15.6% had right, left and Bilateral ear discharge respectively.

The presumptive diagnosis and indication for ear swabbing in these patients all shown in table II. Chronic suppurative otitis media (CSOM) was the most frequent diagnosis (67.4%). This is followed by acute suppurative otitis media (ASOM) 14.4% and otitis externa 18.2%.

Of the 347 patients, 286 (82.4%) yielded positive culture from the ear swab, 232 (81.1%) of these yielded only one organism, 58 (20.3%) yielded a mixture of two organisms while (0.3%) had a mixture of three organism. This particular patient had CSOM. 45(77.6%) of these with two organisms had CSOM. 45 (22.7%) of the culture positive patients with CSOM had polymicrobial agents.

Table III shows the causative agents of discharging ears in the 286 adults. A total of 345 isolates were recovered *Pseudomonas aeruginosa* was the leading organisms (34.6%). *Staphylococcus aureus* with 19.4%, *Klebsiella* species with 17.4% and *Proteus* species with 12.5% closely followed this. Of the 233 cases of presumptive diagnosis of CSOM, 198(85%) yielded organisms. A total of 244 isolates were recovered from these patients. Of these *Pseudomonas* species was the predominant group of agents (38.5%), with *Pseudomonas aeruginosa* being the most prevalent organism 32%. *Klebsiella* spp 17.2%, *Staphylococcus aureus* 16.8% and *Proteus* spp 13.9% closely followed this. 5 cases (2.19%) has *Candida albicans* while 1 (0.4%) had *Aspergillus* spp. 45 of 198 (22.7%) culture positive cases of CSOM had mixed organisms.

Of the 50 patients with ASOM, 37 (74%) were culture positive. A total of 42 isolates were recovered *Pseudomonas* species was the predominant group of organisms with 33.3%. This was followed by *Staphylococcus aureus*, with 28.6%. 5 cases (13.5%) of ASOM had mixed organisms. These were mainly *Staphylococcus aureus*, *Pseudomonas* species and *Klebsiella* species. Of the 63 cases of

Age Range (Yrs)	SEX		SIDE OF EAR DISCHARGE				Total	%
	Male	Female	Right	Left	Bilateral	Unspecified		
16-25	50	38	23	30	19	17	88	25.4
26-35	26	35	19	24	9	9	61	17.6
36-45	20	25	22	12	6	5	45	13.0
46-55	17	24	10	14	4	13	41	18.1
56-65	12	8	7	2	7	4	20	5.8
66-75	20	7	9	9	1	8	27	7.8
76-85	1	3	1	1	0	2	4	1.2
86-95	0	2	0	2	0	0	2	0.6
96	1	0	0	1	0	0	1	0.3
Not Specified	28	30	14	8	8	27	58	16.7
Total	175	172	105	103	54	85	347	100
%	50.4	49.6	30.2	29.7	15.6	24.5	100	

TABLE I - AGE, SEX AND SIDE OF EAR DISCHARGE IN ADULTS

Age Range (YRS)	OTITIS EXTERNA	ASOM	CSOM	POST-OP ABCESS	TOTAL
16-25	12	17	58	1	88
26-35	11	7	43	0	61
36-45	11	3	31	0	45
46-55	10	5	26	0	41
56-65	3	3	14	0	20
66-75	4	2	21	0	27
76-85	1	0	3	0	4
86-95	2	0	0	0	2
>=96	0	0	1	0	1
Not specified	9	13	36	0	58
Total	63	50	233	1	347
%	18.2	14.4	67.1	0.3	100

TABLE II: PRESUMPTIVE DIAGNOSIS OF PATIENTS WITH DISCHARGING EARS

ASOM = Acute Suppurative Otitis Media
CSOM = Chronic Suppurative Otitis Media

DIAGNOSIS	PATHOGENS															Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Otitis Externa	14	11	0	2	9	7	0	0	1	1	0	0	0	4	1	50
ASOM	11	5	0	3	8	5	0	0	3	1	0	1	0	0	0	37
CSOM	37	11	1	14	71	18	7	3	11	12	1	5	1	5	1	198
Post-op abcess	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Total	62	27	1	19	88	30	7	3	15	15	1	6	1	9	2	

COMBINATION OF TWO OR MORE ORGANISMS																Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
Otitis Externa	0	0	0	0	0	3	1	1	1	1	0	0	0	1	0	8
ASOM	1	0	0	1	2	1	0	0	0	0	0	0	0	0	0	5
CSOM	4	3	1	2	7	10	2	2	6	4	0	1	0	2	1	45
Total	5	3	1	3	9	14	3	3	7	5	0	1	0	3	1	58

TABLE III: PATHOGENS OF DISCHARGING EARS IN ADULTS EARS IN IBADAN

KEY: The pathogens: 1= Staphylococcus aureus, 2= Staphylococcus albus, 3= Streptococcus pyogenes, 4= Pseudomonas species, 5= Pseudomonas aeruginosa, 6= Klebsiella species, 7= Klebsiella oxytocolum, 8= Klebsiella rhinoscleromatis, 9= Proteus species, 10= Proteus mirabilis, 11= Proteus rettgeri, 12= Escherichia coli, 13= Haemophilus influenzae, 14= Candida albicans, 15= Aspergillus species.

Bacterial Isolates	ANTIBIOTIC DISCS														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Klebsiella spp	N	38	38	38	40	38	40	40	40	40	40	35	35	38	
	S	2	26	14	27	7	32	26	29	34	40	36	35	15	10
	(%)	5.3	66.7	35.9	67.5	18.9	80	65	72.5	85	100	90	100	100	25
Pseudomonas spp	N	80	89	NT	90	80	92	90	90	90	78	87	86	71	71
	S	20	59		30	40	80	23	20	22.2	88.7	96.7	95.5	88.7	88.7
	(%)	25	66.3		33.3	50	87	25.5	22.2	24.4	96.7	100	100	100	100
Proteus spp	N	30	28	28	30	28	30	30	30	30	24	28	30	30	1
	S	8	0	14	17	6	25	23	24	24	80	100	100	100	4
	(%)	26.7	0	50	56.7	21.4	83.3	76.7	80	80	100	100	100	100	4
Esch. Coli	N	5	5	NT	5	5	5	5	5	5	5	5	5	5	3
	S	2	0		4	1	4	3	4	4	100	100	100	100	60
	(%)	40	0		80	20	80	60	80	80	100	100	100	100	60
Staph. Aureus	N	60	60	58	60	60	60	60	60	60	60	60	58	58	50
	S	9	30	38	52	39	52	48	33	50	60	60	58	58	15
	(%)	15	50	65.5	86.7	65	86.7	80	55	83.3	100	100	100	100	30

TABLE IV: DISC SENSITIVITY PATTERN OF THE BACTERIAL ISOLATES

Key: N = Number Tested, NT = Not tested, S = Number of strains that are sensitive
1 = Ampicillin, 2 = Amoxicillin, 3 = Augmentin, 4 = Azithromycin, 5 = Corrimoxazole,
6 = Gentamicin, 7 = Cefuroxime, 8 = Ceftriaxone, 9 = Cefotaxime, 10 = ciprofloxacin,
11 = Ofloxacin, 12 = Amikacin, 13 = Streptomycin, 14 = Tetracycline

otitis externa. 50 (79.4%) yielded microorganisms. A total of 58 isolates were recovered. The predominant organisms was *Staphylococcus aureus* with 24.1%. This was followed by *Pseudomonas aeruginosa* 19%. Four cases had *Candida albicans* (65%) while one had *Aspergillus* species. Staphylococci, *Pseudomonas* and *Proteus* species coexisted with these fungi.

The disc sensitivity pattern of the isolates is shown in table IV. Ofloxacin, ciprofloxacin (ciprotab) had the best activity against the isolates. Ceftazidime, azithromycin, cefuroxime, ceftriaxone and gentamicin had good sensitivity against two third of the stains of all isolates. Ampicillin, amoxycillin, cotrimoxazole, streptomycin and tetracycline had poor activity against the bacterial isolates.

DISCUSSION

The epidemiology of both otitis externa and media is still not well charted, the etiology and pathogenesis are imperfectly understood, their treatment is controversial and subject to change particularly so little is known about middle ear infection(1). The results of our study have thrown some light upon some of these issues. Hence the pathogenic agents of these discharging ears are found to be polymicrobial in 20.3% of cases and monomicrobial (79.7%). The most frequent agents were *Pseudomonas* species, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella* species and *Proteus* species were the main causative agents of ASOM and CSOM. This finding agrees with reports of previous workers that *Haemophilus Influenzae* and *Streptococcus pneumoniae* do not play an important role in the pathogenesis of otitis media in the tropics (3). It is possible that the indiscriminate use of antibiotics by most patients in our environment contrib-

ute to the selection of the Gram Negative bacilli found in our patients, majority of whom present late to hospital. This fact may also explain the culture negative results got in some of case of discharging ears.

Anaerobes were not routinely checked for because of technical problems associated with specimen collection and transportation. Subsequent studies will address this issue, as well as Tubercle bacilli as pathogenic agent of discharging ears.

With ceftazidime, azithromycin, ceftriazone, cefuroxime and gentamicin showing good activity against tow third of these isolates, we would recommend their use as the first line antibiotherapy of discharging ears. The quinolones should be reserved drugs while the penicillin cotrimoxazole and tetracycline are not useful. These chemotherapeutic agents should be combined with metronidazole to take care of anaerobes and the use of antifungal cream as wick in dressing for the fungi.

REFERENCES

1. Brobby G.W. The discharging ear in the tropics guide to diagnosis and management in the district hospital. *Tropical Doctor*, 1992: 22:10-13.
2. Chesbrough M. *Medical Laboratory Manual for Tropical Countries*. Vol. II: Microbiology. Cambridge University Press. 1991: 146-156, 199-205.
3. Brobby G.W. Frimpong E.H. Bacteriology of Chronic otitis media in Ghana. *Proceedings of the 31st Annual Conference of the West African College of Surgeons, Lome - Togo 3-9, Feb. 1991.*