

THE RESULTS

One hundred patients with a diagnosis of acute otitis media were entered in the study, there were 52 boys and 48 girls (Table 15) middle ear fluid culture yielded pathogenes in 95 patients (95% of 100 patients) Nasopharyngeal swab culture yielded pathogen in 94 patients (94% of 100 patients) (Table 10)

Organisms isolated were Streptococcus pneumoniae, Haemophilus influenzae, Streptococcus pyogenes, Staphylococcus aureus, Nisseria sp. and gram-ve bacilli (Table 11-12).

95 cases had unilateral acute otitis media 5 cases had bilateral acute otitis media which showed a correlation between the pathogens yielded from right and left middle ear swabs cultures. So the number of the ears examined were considered equal to the number of the patients. 3 patients (3% of 100 patients) had a polymicrobial middle ear infection with two separate pathogenic bacterial species isolated from the middle ear culture while 9 patients (9% of 100 patients) had a polymicrobial nasopharyngeal organisms with two separate bacterial species isolated from the nasopharyngeal culture (Table 14). one patient of polymicrobial middle ear culture with Streptococcus pneumoniae and Staphylococcus aureus Showed a correlation with the nasopharyngeal swab culture taken from the

same patient (Table 14) which showed the same sensitivity to Dicloxacillin sodium with the same minimal inhibitory concentrations.

Five patients (5% of 100 patients) showed no growth for the middle ear culture and 6 patients (6% of 100 patients) showed no growth for the Nasopharyngeal culture among these patients there was one patient showed no growth both in middle ear culture and nasopharyngeal culture (Table 13). The negative culture may be due to denying of the patients or their parents that they were under antibiotic therapy when we were taking the swabs or due to anaerobic pathogens which were not taking in consideration in this study. So 10 patients (10% of 100 patients) were excluded from the results (Table 13). 63 patients of the rest 90 patients (70% of 90 patients) showed a correlation between pathogens isolated from middle ear discharge and Nasopharynx. When sensitivity tests were done 3 cases from these 63 patients (3.3% of 90 patients) showed a difference in response to the type of the antibiotic and there minimal inhibitory concentrations. So 60 patients (66.7% of 90 patients) could be considered to have a full correlation between pathogens from the middle ear and Nasopharynx. 27 patients (30% of 90 patients) showed no correlation between pathogens isolated from middle ear discharge and Nasopharynx (Table 16).

The results of the bacteriological studies of the cases with subacute otitis media showed no middle ear growth. This may be due to the patients were under antibiotic therapy during the swabs. 7 patients (70% of 10 patients) showed a correlation between nasopharyngeal and adenoid tissue cultures. 3 patients (30% of 10 patients) showed no correlation between Nasopharyngeal and adenoid tissue cultures.

Table (1) Middle ear and nasopharyngeal culture from patients aged (from 6 to 12 months).

Patient	Age	Sex		Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
		Male	Female							
1	6	M		--	--	St. pneumoniae Staph. aureus	St. pneumoniae Staph. aureus	+	-	-
2	7		F	Staph. aureus	--	--	St. pyogenes H. influenzae	-	+	-
3	6		F	St. pneumoniae	--	--	Staph. aureus H. influenzae	-	+	-
4	9	M		St. pneumoniae	no growth	--	--	-	-	+
5	10	M		Staph. aureus	no growth	--	--	--	-	+
6	11		F	St. pneumoniae	H. influenzae	--	--	-	+	-
7	8	M		St. pneumoniae	St. pneumoniae	--	--	+	--	-
8	7		F	H. influenzae	H. influenzae	--	--	+	-	-
9	9		F	St. pyogenes	St. pyogenes	--	--	+	-	-
10	6	M		St. pneumoniae	St. pneumoniae	--	--	+	--	-
11	8	M		Staph. aureus	Staph. aureus	--	--	+	--	-
12	9	M		St. pneumoniae	St. pneumoniae	--	--	+	-	-
13	10	M		St. pneumoniae	St. pneumoniae	--	--	+	-	-
Total		8	5	12	8	1	3	8	3	2

Table (2a) Middle ear and nasopharyngeal cultures patients aged from (13 to 24 months)

Patient	Age	Sex Male Female	Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
1	13	M	--	H. influenzae	St. pneumoniae Staph. aureus	----	-	+	-
2	13	F	St. pneumoniae	--	--	H. influenzae Gram-ve bacilli	-	+	-
3	16	F	Staph. aureus	--	--	St. pyogenes St. pneumoniae	-	+	-
4	19	M	H. influenzae	--	--	St. pyogenes Staph. aureus	-	+	-
5	14	F	no growth	no growth	--	--	-	-	+
6	21	M	St. pneumoniae	Gram-ve bacilli	--	--	-	+	-
7	18	M	H. influenzae	St. pneumoniae	--	--	-	+	-
8	20	F	St. pyogenes	Staph. aureus	--	--	-	+	-
9	22	F	Staph. aureus	H. influenzae	--	--	-	+	-
10	15	F	Staph. aureus	Staph. aureus	--	--	+	-	-
11	23	M	H. influenzae	H. influenzae	--	--	+	-	-
12	17	M	St. pneumoniae	St. pneumoniae	--	--	+	-	-
13	23	M	St. pneumoniae	St. pneumoniae	--	--	+	-	-
14	23	M	St. pyogenes	St. pyogenes	--	--	+	-	-
Total		8 6	12	10	1	3	5	8	1

Table (2b) Middle ear and nasopharyngeal culture from patients aged from (13-24 months)

Patient	Age	Sex		Pure middle ear culture		Pure nasopharyngeal culture		Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
		Male	Female									
15	18	M		Staph. aureus		Staph. aureus		--	--	+	-	-
16	19		F	St. pneumoniae		St. pneumoniae		--	--	+	-	-
17	18	M		H. influenzae		H. influenzae		--	--	+	-	-
18	15		F	St. pyogenes		St. pyogenes		--	--	+	-	-
19	20	M		St. pneumoniae		St. pneumoniae		--	--	+	-	-
20	22		F	Staph. aureus		Staph. aureus		--	--	+	-	-
21	23	M		St. pneumoniae		St. pneumoniae		--	--	+	-	-
22	21	M		St. pneumoniae		St. pneumoniae		--	--	+	-	-
23	14		F	H. influenzae		H. influenzae		--	--	+	-	-
24	13		F	St. pneumoniae		St. pneumoniae		--	--	+	-	-
25	24		F	St. pneumoniae		St. pneumoniae		--	--	+	-	-
26	15		F	St. pneumoniae		St. pneumoniae		--	--	+	-	-
27	22	M		Staph. aureus		Staph. aureus		--	--	+	-	-
28	21	M		H. influenzae		H. influenzae		--	--	+	-	-
29	20		F	St. pneumoniae		St. pneumoniae		--	--	+	-	-
Total		7	8	15		15		--	--	15	-	-

Table (3) Middle ear and nasopharyngeal culture from patients aged from (25-36 months)

Patient	Age	Sex		Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
		Male	Female							
1	24	M		Staph. aureus	--	--	Nisseria sp. St. pyogenes	-	+	-
2	26	M		No growth	H. influenzae	--	--	-	-	+
3	30	M		St. pneumoniae	H. influenzae	--	--	-	+	-
4	31	M		St. pneumoniae	gram-v bacilli	--	--	-	+	-
5	29	M		Staph. aureus	Staph. aureus	--	--	+	-	-
6	25	M		St. pyogenes	St. pyogenes	--	--	+	-	-
7	33	M		H. influenzae	H. influenzae	--	--	+	-	-
8	31	F		St. pneumoniae	St. pneumoniae	--	--	+	-	-
9	35	F		H. influenzae	H. influenzae	--	--	+	-	-
10	29	F		St. pyogenes	St. pyogenes	--	--	+	-	-
11	28	F		St. pneumoniae	St. pneumoniae	--	--	+	-	-
12	27	F		H. influenzae	H. influenzae	--	--	+	-	-
13	26	F		Staph. aureus	Staph. aureus	--	--	+	-	-
Total		7	6	12	12	--	1	9	3	1

Table (4) Middle ear and nasopharyngeal culture from patients aged from (37-48 months)

Patient	Age	Sex		Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
		Male	Female							
1	37	M		--	Staph. aureus	St. pyogenes	--	-	+	-
2	40	M		St. pyogenes	no growth	--	--	-	-	+
3	41		F	St. pneumoniae	H. influenzae	--	--	-	+	-
4	45		F	St. pneumoniae	St. pneumoniae	--	--	+	-	-
5	38		F	H. influenzae	H. influenzae	--	--	+	-	-
6	39	M		H. influenzae	H. influenzae	--	--	+	-	-
7	43	M		Staph. aureus	Staph. aureus	--	--	+	-	-
8	44		F	St. pneumoniae	St. pneumoniae	--	--	+	-	-
9	40		F	St. pyogenes	St. pyogenes	--	--	+	-	-
10	38		F	St. pneumoniae	St. pneumoniae	--	--	+	-	-
11	39	M		Staph. aureus	Staph. aureus	--	--	+	-	-
12	46	M		St. pneumoniae	St. pneumoniae	--	--	+	-	-
Total		6	6	11	11	1	--	9	2	1

Table (5) Middle ear and nasopharyngeal culture in patients aged from (49-60months)

Patient	Age	Sex		Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
		Male	Female							
1	49	M		St. pneumoniae	--	--	Staph. aureus H. influenzae	-	+	-
2	50		F	No growth	Staph. aureus	--	--	-	-	+
3	52		F	Nisseria sp.	Staph. aureus	--	--	-	+	-
4	53		F	St. pyogenes	St. pneumoniae	--	--	-	+	--
5	48	M		Staph. aureus	St. pneumoniae	--	--	-	+	-
6	54	M		H. influenzae	H. influenzae	--	--	+	-	-
7	56		F	H. influenzae	H. influenzae	--	--	+	-	-
8	49		F	Staph. aureus	Staph. aureus	--	--	+	-	-
9	49	M		St. pneumoniae	St. pneumoniae	--	--	+	-	-
10	58		F	St. pyogenes	St. pyogenes	--	--	+	-	-
11	50	M		Staph. aureus	Staph. aureus	--	--	+	-	-
12	52	M		St. pneumoniae	St. pneumoniae	--	--	+	-	-
Total		6	6	11	11	--	1	7	4	1

Table (6) Middle ear and nasopharyngeal cultures in patients aged from (61-72 months)

Patient	Age	Sex		Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
		Male	Female							
1	61	M		St. aureus	--	--	St. pyogenes Gram-ve bacilli	-	+	-
2	70		F	No growth	H. influenzae	--	--	-	-	+
3	65	M		St. pneumoniae	St. pneumoniae	--	--	+	-	-
4	67		F	H. influenzae	H. influenzae	--	--	+	-	-
5	71		F	St. pneumoniae	St. pneumoniae	--	--	+	-	-
Total		2	3	4	4	--	1	3	1	1

Table (7) Middle ear and nasopharyngeal cultures from patient aged from 73-84 months

Patient	Age	Sex		Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
		Male	Female							
1	73	M		H. influenzae	no growth	--	--	-	-	+
2	78	M		St. pneumoniae	H. influenzae	--	--	-	+	-
3	80		F	St. pneumoniae	H. influenzae	--	--	-	+	-
4	82		F	St. pyogenes	St. pyogenes	--	---	+	-	-
5	83		F	St. pneumoniae	St. pneumoniae	--	--	+	-	-
6	77	M		Staph. aureus	St. aureus	--	--	+	-	-
Total		3	3	6	5	--	--	3	2	1

Table (8) Middle ear and nasopharyngeal culture from patients aged from (85-96 months)

Patient	Age	Sex Male Female	Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
1	89	M	H. influenzae	No growth	--	--	-	-	+
2	88	M	St. pneumoniae	St. pyogenes	--	--	-	+	-
3	90	F	H. influenzae	Staph. aureus	--	--	-	+	-
4	86	F	St. pneumoniae	St. pneumoniae	--	--	+	-	-
Total		2 2	4	3	--	--	1	2	1

Table (9) Middle ear and nasopharyngeal culture from patients aged from (97-120 months)

Patient	Age	Sex		Pure middle ear culture	Pure nasopharyngeal culture	Mixed middle ear culture	Mixed nasopharyngeal culture	Correlated cases	No correlation	Excluded cases
		Male	Female							
1	105		F	No growth	St. pneumoniae	--	--	-	-	+
2.	100		F	H. influenzae	St. pneumoniae	--	--	-	+	-
3	120	M		St. pneumoniae	H. influenzae	--	--	-	+	-
4	130	M		H. influenzae	H. influenzae	--	--	+	-	-
5	110		F	St. pneumoniae	St. pneumoniae	--	--	+	-	-
6	100	M		St. pneumoniae	St. pneumoniae	--	--	+	-	-
Total		3	3	5	6	--	--	3	2	1

Table (10) The correlation results of the previous (9 Tables)

Age of the patients	Number of the patients	Pure middle ear culture	mixed middle ear culture	Pure Naso- pharyngeal culture	Mixed Naso- pharyngeal culture	Correlated cases of pure cultures	No. correlation	Correlated cases of mixed cultures	Excluded cases	Sex male female
0-12 M Table 1	13	12	1	8	3	7	3	1	2	8 5
13-24 M Table 2a, 2b	29	27	1	25	3	20	8	--	1	15 14
25-36 M Table 3	13	12	--	12	1	9	3	--	1	7 6
37-48 M Table 4	12	11	1	11	--	9	2	--	1	6 6
49-60 M Table 5	12	11	--	11	1	7	4	--	1	6 6
61-72 M Table 6	5	4	--	4	1	3	1	--	1	2 3
73-84 M Table 7	6	6	--	5	--	3	2	--	1	3 3
85-96 M Table 8	4	4	--	3	--	1	2	--	1	2 2
97-120 M Table 9	6	5	--	6	--	3	2	--	1	3 3
Total	100	92	3	85	9	62	27	1	10	52 48

Table (11) Nasopharyngeal bacterial cultures of 100 cases of Acute otitis media in relation to Age of the patient

Bacteria	6-12 Months	13-24 Months	25-36 Months	37-48 Months	49-60 Months	61-72 Months	73-84 Months	85-96 Months	97-120 Months	Total
St. pneumoniae	Pure 4 Mixed 1	11 1	2 --	4 --	4 --	2 --	1 --	1 --	4 --	35 --
H. influenzae	Pure 2 Mixed 2	6 1	5 --	3 --	2 1	2 --	2 --	--	2 --	28
Staph. aureus	Pure 1 Mixed 2	5 1	2 --	3 --	4 1	--	1 --	1 --	--	21
St. pyogenes	Pure 1 Mixed 1	2 2	1 1	1 --	1 --	--	1 --	1 --	--	14
Nisseria sp.	Pure -- Mixed --	-- --	-- 1	-- --	-- --	-- --	-- --	-- --	-- --	1
Gram -ve bacilli	Pure -- Mixed --	1 1	1 --	-- --	-- --	-- 1	-- --	-- --	-- --	4
Sterile	2	1	--	1	--	--	1	1	--	
Number of the patients	13	29	13	12	12	5	6	4	6	103

Table (12) Middle Ear Bacterial cultures of 100 cases of Acute otitis media in relation to Age of the patient

Bacteria	6-12 Months	13-24 Months	25-36 Months	37-48 Months	49-60 Months	61-72 Months	73-84 Months	85-96 Months	97-120 Months	Total
St. pneumoniae	Pure 7 Mixed 1	12 1	4 --	5 --	3 --	2 --	3 --	2 --	3 --	43 --
H. influenzae	Pure 1 Mixed --	6 --	3 --	2 1	2 --	1 --	1 --	1 --	2 --	21 --
Staph. aureus	Pure 3 Mixed 1	6 1	3 --	2 --	3 --	1 --	1 --	--	--	21 --
St. pyogenes	Pure 1 Mixed --	3 --	2 --	2 1	2 --	--	1 --	--	--	12 --
Nisseria sp.	Pure -- Mixed --	-- --	-- --	-- --	1 --	--	--	--	--	1 --
Gram -ve bacilli	Pure -- Mixed --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Sterile	--	1	1	--	1	1	--	--	1	--
Number of the patient	13	29	13	12	12	5	6	4	6	98

Table (13) Excluded Cases

Age of the patient in months	Patients Sex No. Age	Middle ear culture	Nasopharyngeal culture
6-12 M	M 4 9m	St. pneumoniae	No growth Table 1
	M 5 10m	Staph. aureus	No growth
13-24 M	F 5 14m	No growth	No growth Table 2
25-36 M	M 2 26m	No growth	H. influenzae Table 3
37-48 M	M 2 40m	St. pyogenes	No growth Table 4
49-60 M	F 2 50m	No growth	St. aureus Table 5
61-72 M	F 2 70m	No growth	H. influenzae Table 6
73-84 M	M 1 70m	H. influenzae	No growth Table 7
85-96 M	M 1 89m	H. influenzae	No growth Table 8
97-120 M	F 1 105m	No growth	St. pneumoniae Table 9
6M+4F	5 cases No growth, 2 cases é H. influenzae 1 case St. pneumoniae, 1 case Staph. aureus 1 case é st. pyogenes		6 cases é No growth, 2 cases é H. influenzae 1 case é St. pneumoniae, 1 case é Staph. aureus.

Table (14) The patients with mixed middle ear and Nasopharyngeal culteries

Age of the patient in months	No. of the patient mixed	Middle ear culture	Patient culture	No. of the patients é mixed Nasopharyngeal culture	Nasopharyngeal culture		
6-12	1	<u>St. pneumoniae</u> Staph. aureus	No 1 No 2	3	<u>St. pneumoniae</u> St. pyogenes H. influenzae Staph. aureus H. influenzae	1 2 2 3 3	Correlated Not correlated Not correlated Not correlated Not correlated
Table (1)		St. pneumoniae	No 3				
13-24 Months	1	St. pneumoniae St. aureus H. influenzae	No 2 No 3 No 4	3	H. influenzae + gram-ve bacilli St. pyogenes + St. pneumoniae St. pyogenes Staph. aureus H. influenzae	2 3 3 4 1	Not correlated Not correlated Not correlated Not correlated Not correlated
Table (2)		St. pneumoniae Staph. aureus	No 1				
25-36	--	Staph. aureus	No 1	1	Nisseria + st. pyogenes	1	Not correlated
Table (3)							
37-48	1	St. pyogenes H. influenzae	No 1	--	Staph. aureus	1	Not correlated
Table (4)							
49-60	--	St. pneumoniae	No 1	1	Staph. aureus H. influenzae	1	Not correlated
Table (5)							
61-72	--	Staph. aureus	No 1	1	St. pyogenes Gram-ve bacilli	1	Not correlated
Table (6)							
73-84							
Table (7)							
85-96	Table (8)						
97-120	Table (9)						
Total	3						

Table (15) Correlation of middle ear and nasopharyngeal cultures in relation to sex.

	Male Patient	Female patient
No. of patients excluded of -ve cultures	6	4
Full correlation	30	30
Partial correlation	2	1
No correlation	14	13

Table (16) The middle ear and nasopharyngeal correlation in 90 patients with Acute otitis media.

	No. of patients (90)	Correlation percent
Full correlation	60	66.7%
Partial correlation	3	3.3%
No correlation	27	30.0%

Table (17) middle ear, nasopharyngeal and adenoid tissues cultures in patients with subacute otitis media

	Patients with subacute course	age in month	sex	Middle ear		Nasopharyngeal		adenoid tissue	
				male	female	culture	culture	culture	culture
1	No. 13 in Table 2a	23	M	--	--	no growth	<u>Staph. aureus</u>	<u>Staph. aureus</u>	
2	No. 3 in Table 3	30	M	--	--	no growth	<u>St. pyogenes</u>	<u>St. pyogenes</u>	
3	No. 9 in Table 3	35	--	F	--	no growth	<u>Staph. aureus</u>	<u>Staph. aureus</u>	
4	No. 11 in Table 3	28	--	F	--	no growth	<u>St. pyogenes</u>	<u>Staph. aureus</u>	
5	No. 12 in Table 3	27	--	F	--	no growth	<u>H. influenzae</u>	<u>St. pneumoniae</u>	
6	No. 3 in Table 4	41	--	F	--	no growth	<u>St. pneumoniae</u>	<u>Staph. aureus</u>	
7	No. 7 in Table 4	43	M	--	--	no growth	<u>St. pneumoniae</u>	<u>St. pneumoniae</u>	
8	No. 12 in Table 4	46	M	--	--	no growth	<u>Staph. aureus</u>	<u>Staph. aureus</u>	
9	No. 5 in Table 5	48	M	--	--	no growth	<u>H. influenzae</u>	<u>H. influenzae</u>	
10	No. 9 in Table 5	49	--	F	--	no growth	<u>St. pyogenes</u>	<u>St. pyogenes</u>	

Table (18) Correlation of Nasopharyngeal and Middle Ear Cultures

Year	Source	Total No. in series	Middle ear pathogen recovered	No correlation with Nasopharynx	% of correlation	No growth from ear %
Proponents						
1945	Nielson	285	285	239	84	0
1971	Howie & Piousard	288	182	179	98	37
1971	Kamme et al	75	60	59	98	20
1972	Branellores- Helander et al.	237	83	62	74	36
1975	Branellores- Helander et al	36	16	15	94	56
Total		921	626	554	88	...
Opponents						
1952	Bjuggren & Tunevall	118	114	57	48	3
1956	Mortimer & Waterson	104	36	25	69	37
1964	Townsend	44	33	18	55	44
1968	Feingold et al	90	35	24	69	47
1969	Nilson et al	306	76	36	50	41
1972	Bland	21	19	5	28	10
Total		398	313	165	53	...