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COMPARATIVE STUDY OF DIFFERENT MODALITIES OF MEDICAL TREATMENT OF CHRONIC SUPPURATIVE OTITIES MEDIA

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Abstract

Active chronic suppurative otitis media poses a management problem. Different types of treatment strategy were tried for 136 patients, 36 patients received systemic antibiotics, 26 patients received local antibiotics, 42 patients combined local and systemic, and the last group (32 patients) received no antibiotics. The majority of patients had moderate size tympanic membrane perforation (59%). Eighty-two patients had severe (active) symptoms (60%). The commonest types of bacteria isolated were streptococcus pneumoniae and staphylococcus aureus (29%, 21% respectively). It is found that, the best type of treatment was the local antibiotic therapy (84% improvement), followed by combined antibiotic therapy (local and systemic) which equal to 83% improvement. There was no benefit of using systemic antibiotics without aural toilet (5% improvement). It is important to mention that the use of antibiotic/ steroid ear drop gave good improvement result (95%), in comparison with the use of antibiotic ear drop (50%).

Introduction

Chronic otitis media (COM) represents the most advanced form of otitis media and may be defined as the presence in the middle ear of permanent or intractable pathological changes[1]. This definition encompasses cases of chronic suppurative otitis media (CSOM), a term originally defined in the pre-antibiotic era as a persistent otorrhoea through a non-intact tympanic membrane but subsequently understood to cover a much wider spectrum of chronic ear disease than the original defining term "suppurative" would suggest[2,3].The assessment and management of CSOM presents many challenges and fascinating problems, the state of an individual ear involved in chronic disease present the balance established at a particular time between the

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progression of the disease process on the one hand and the healing response within the middle ear cleft on the other[4,5].

Active CSOM forms a major proportion of the clinical work load of an average otolaryngological practice, a great deal of expense is incurred in both general and hospital practice by the use of either topical or systemic antimicrobial and, all too often. The results of controlling the infection are disappointing to both patients and clinicians a like. Antimicrobial agents used in the treatment of active CSOM either topically or systemically or by both routes.

Topical antibiotic therapy has been extensively used in the treatment of active CSOM in both children and adult. The total duration of topical application of antibiotic ear drops required to eradicate infection in active CSOM without any adverse effect on cochlear function, it not quite clear nor is the therapeutic value[5,6]. A lack of large scale controlled trails is mainly responsible for a wide gap in our knowledge of the use of topical antibiotics in active CSOM.

It is not unusual to see recommendations of therapy lasting from a few weeks to a few months[7].

It could be said that almost all available systemic antibiotics have been tried in the treatment of CSOM as a result of the wide variety of Gram-positive and Gram-negative microbes isolated from such ears. However, their efficacy in controlling the disease has been disappointing, particularly in the diffuse mucosal variety and the results are further clouded by the lack of large scale controlled trials[8] .

Patients and methods:

One hundred and thirty-six patients randomly selected as to age, or sex exhibiting otorrhoea-associated recurrent suppurative otitis media with tympanic membrane perforation, encountered between the August 2000 and October 2002, were included into this study. Other patients were seen but they excluded from the study either because of follow-up difficulties, pregnancy or unsafe ears.

Swabs for culture and sensitivity were taken from all the patients. Sixty-three patients received systemic antibiotics only (Augmentin), 26 patients received local antibiotics (10 of them only antibiotic ear drops, 16 received antibiotics/ steroid ear drops), 42 received combination of local and systemic antibiotics (12 patients received antibiotic ear drops while 30 patients received ear drops of antibiotic and steroid), the rest of our patients (32) received no antibiotics.

All the patients, except the 16 who received systemic antibiotics, were instructed to clean the ear by self-made small cotton-buds and advised to carry out aural toilet three times a day. On each occasion, the ear is mopped dry until the cotton-buds are free of exudates. The patients were also informed to prevent water from gaining access into the ear (cotton wool smeared with ointment).

Assessment was based on symptomatology and examination for otorrhoea, otalgia and tinnitus. The size of perforations was estimated according to its proportion of intact part of tympanic membrane into small, medium and large.

Results:

Size of perforation*:* Table I shows the distribution of the size of perforation of tympanic membrane amongst our patients with CSOM. The majority (43%) had medium size perforations, while those with large size perforations comprised only 20%.

Severity of the disease: We found that 60% of studied patients had severe (active) disease while 40% had mild to

moderate activity disease. These findings are presented in table II.

Bacteriology: Table III shows the frequency of organisms cultured of ear swabs from all the studied patient. Streptococcus pneumonae comprise 29%, followed by staphylococcus aurius 21%, while the percentage of pseudomonas aerogenosa and klebsiella were 7% and 41% respectively, 21%, of the patients had negative culture.

Improvement: Table IV presents the improvement of the disease according to the different types of treatment. The overall number of patients who improved by all types of treatment were 78 patients and the remainder not improved. The table also shows that nearly equal percentage of patient improved due to the use of local therapy and those used combination of systemic and local therapy (85%, 83% respectively). The same thing was observed in those who used only systemic therapy and those who used only aural toilet (30%).

The frequency of improvement in patients who received systemic antibiotics with or without aural toilet is shown in table V, it illustrates that 10 out of 16 patients who received systemic antibiotics and learned to do proper aural toilet were improved (62%), while just one out of 20 patients who received only antibiotics without aural toilet was improved (5%).

Table VI shows the improvement of the disease in those used local antibiotics and those received a combination of local and systemic antibiotics and whether local antibiotics were combined with steroid or not. It was found that 94% of those patients who received local antibiotics with steroids got improved, while just half of the patients improved by local antibiotics without steroids. Furthermore, 93% of patients who received combination of systemic and local antibiotics that mixed with steroid were improved.

The relationship between the size of perforation and improvement is presented in table VII, seventy-four percent of those with large size perforation improved, and this percent decreased with the decrease in the size of perforation. Respective figures were 63% for the medium and 42% for the small size perforations.

Discussion:

Size of perforation: The majority of patients included in our study had moderate size perforations (43%), this result is different from Michael's[9] finding (42% small, 21% medium, 37% large). Reviewing of literature searching for the causes of variation in the size of perforation gave us no answer. It may probably due to long standing or recurrent infection. The size of perforation plays an important role in efficacy of the treatment and improvement of the disease due to easy access of local therapy. Watter[10] stated that in cases of tiny small perforation, minimal amount of the drug enter the middle ear, while with large perforation, drops can be very effective in cleaning up and healing the ear. We found that when the size of perforation increases, the improvement percentage of the disease increases too (74% for the large, 62% for the medium, 42% for the small size perforations).

Severity (activity) of the disease: The majority of the studied patients (82 patient, 60%) had active disease, this estimated by the presence of active otorrhoea, tinnitus and sometimes pain. A study done at Hong Kong 1996[9], they found that 39% of patients had severe symptoms and signs, the rest of patients (61%) had mild to moderate severity. Such difference is expected because of the poor sanitation, overcrowding and delay in medical consultation in our society.

Bacteriology: Fig.1 shows the organisms cultured in different studies in comparison to our study. The causes behind negative cultures in 21 patients were probably due to antibiotics taken before the culture, or due to lab error or because of anaerobic infection.

Improvement: Seventy eight patients out of the total 136 (57%) improved by the different types of treatment used in this study.

Topical treatment*:* Eighty five of all patients who received topical treatment eventually improved. Topical therapy has been extensively used in the treatment of active CSOM in both children and adults [5, 6]. In our study we used 2 types of eardrops, antibiotic/ steroid eardrops (Methadin N) and antibiotic without steroid eardrops (Gentamycine or Chloramphenicol). The interesting finding was that more than 94% of those who received antibiotic/steroid eardrops improved, while only 50% of those who received antibiotics without steroid eardrops improved. Browning et al [21,22] found a significant benefit (65%) when antibiotic/steroid eardrops were used for patients with active CSOM. The presence of a steroid with an antibiotic enhances the efficacy of the antibiotic as clarified by Alpert[23]. In USA, a study done at 2000 stated that topical antibiotics constitute first-line treatment for patients with CSOM, furthermore they found no evidence that systemic antibiotics alone or in combination with topical preparations improve treatment outcomes compared with topical antibiotics alone[24].

Systemic antibiotics: The improvement that resulted from the use of the systemic antibiotic Augmentin (Amoxicillin+ Clavylanic acid) only was disappointing (31%). However, the improvement increased to 62% if the patients were instructed to do regular aural toilet, while it was only 5% for those not learned to clean their ears. The addition of local therapy to the systemic treatment added nothing to the percentage of improvement 85% and topical and systemic 83% respectively.

Aural toilet: Aural toilet as one modality of treatment of active CSOM gave improvement of only 31% in the present study. This result is quite different from a study done at 1984 which showed 85% improvement of patients treated by dry mopping with cotton-buds[22].

Our results are different from Browning's who reported no significant difference in improvement between aural toilets, systemic or topical antibiotics[7].

In conclusion; There were nearly equal results of improvement between the patients who received local antibiotics and those received a combination of local and systemic antibiotics, so that local antibiotics on their own are probably enough for treatment of active chronic SOM.

Steroid containing anti-biotic eardrops gave very good results than the use of antibiotic eardrops only.

The benefit of systemic antibiotics without teaching the patients how to clean their ears is minimal, however, the benefit of aural toilet alone without local or systemic antibiotics is limited too.

Table I. Types of treatment of (CSOM) in relation to sizes of tympanic membrane perforation.

Type of treatment / Size perforation	Systemic		Local		Combination		Toilet		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Small	16	44	6	23	16	38	12	37	50	37
Medium	14	39	12	46	20	48	13	41	59	43
Large	6	16	8	30	6	14	7	22	27	20
Total	36		26		42		32		136	100

Table II. Severity (activity) of (CSOM) in relation to different types of treatment

Type of treatment / Severity of disease	Systemic		Local		Combination		Toilet		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sever(active)	22	61	18	69	31	74	11	34	82	60
Mild to moderate	14	39	8	31	11	26	21	66	54	40
Total	36		26		42		32		136	

Table III. The frequency of different types of organisms in patients with (CSOM).

Type of treatment / Organisms	Systemic		Local		Combination		Toilet		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Strept.pneumoniae	7	19	8	30	9	21	16	50	40	29
Staph.aureus	8	22	4	15	7	17	9	28	28	21
Proteus sp.	7	19	7	26	8	19	3	9	25	18
Pseudomonas aeruginosa	4	11	2	7	2	5	1	3	9	7
Klebsiella sp.	-	-	1	3	4	9	-	-	5	4
No growth	10	28	4	15	12	28	3	9	29	21
Total	36		26		42		32		136	

Table IV. The frequency of improvement according to the different types of treatment**.**

Type of treatment / Severity of disease	Systemic		Local		Combination		Toilet		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Improve	11	31	22	85	35	83	10	31	78	57
Not improve	25	69	4	15	7	17	22	69	58	43
Total	36		26		42		32		136	

Table V. The frequency of improvement in patients received systemic antibiotic with or without toilet

Systemic treatment With or without toilet	Systemic Toilet		Systemic only		Total	
Improvement	No.	%	No.	%	No.	%
Improve	10	62	1	5	11	30
Not improve	6	38	19	95	25	70
Total	16		20		36	100

Table VI. Frequency of improvement according to types of antibiotics “local or systemic” and whether local, combined or not with steroid.

Improvement / Type of drops	Local antibiotic		Total	Combined with systemic		Total
	Improved	Not improved		Improved	Not improved	
Antibiotic & steroid	15 (94%)	1 (6%)	16	28 (93%)	2 (7%)	30
Antibiotic only	5 (50%)	5 (50%)	10	7 (58%)	5 (42%)	12
Total	20 (77%)	6 (23%)	26	35 (83%)	7 (17%)	42

Table VII.Relationship between size of perforation and improvement.

Size of perforation	**Small**		**Medium**		**Large**		**Total**	
Improvement	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Improved	21	42	37	63	20	74	78	57
Not improved	29	58	22	37	7	26	58	43
Total	50		59		27		136	

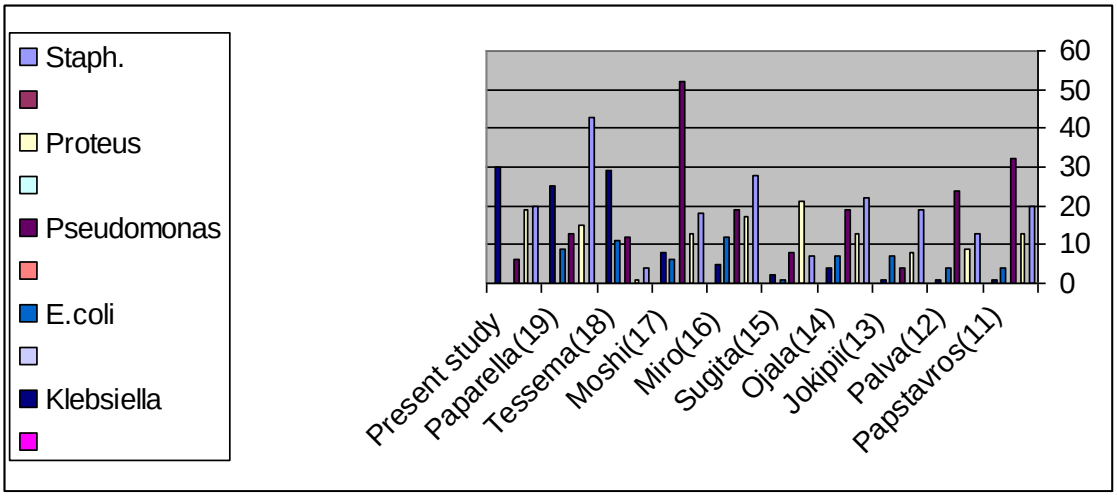

Fig.1: Comparison of the present study with other studies regarding the cultured microorganisms

References

1-Jung T, Hanson J. Classification of otitis media and surgical principles. Otolaryngol Clinic North Am, 1999; 369-82.

2-Wright T, Ludman H. Introduction to middle ear and mastoid disease in: Ludman H, eds. Disease of the ear, 6th edn. London: Arnold, 1998: 331-3.

3-Harold F, Schuknekt. Pathology of the ear. 3rd edn. London: A commonwealth fund book, 1976; 215-271.

4-Bluestone CD, Klein JO, Otitis media, atelactasis and Eustachian tube dysfunction. In: Bluestone CD, stool SE, Kenna MA, eds, Paediatric otolaryngology. 3rd ed. Philadelphia: WB Saunders, 1996: 388.

5-Kenna MA. Otitis media with effusion. In: Baily BJ, eds. Head Neck surgery otolaryngology, 2nd edn. Lippincott-Raven, 1998 1297-1310.

6-Kenna MA, White G, Wad R,. Post JC, Ehrlich G. Bacteriology of otorrhoea: PCR virsus culture. In: Lim DJ Bluestone CD, eds. Recent advance in OM: Proceeding of the sixth international symposium on OM, Ontario: BC Deeker, 1996: 428-430.

7-Browning G, Picozzi G, Sweeney G, Calder T. Role of anaerobes in chronic otitis media. 1983; 8: 47-51.

8-Bluestone CD, Kenna MA. CSOM: Antimicrobial therapy or surgery? Paediatric Annals. 1984; 13: 417-421.

9-Michael CF, John KS, C.Andrew VH. A double-blind comparative study of ofloxacin otic drops versus neomycin - polymyxin B-hydrocortisone otic drops in the medical treatment of CSOM. Journal of Laryngol and Otol. 1996; 110: 309-314.

10-Watter Modell. Drug of choice 1970-1971. Mosby Company Saint Lowis. 1970; Pp. 676.

11-Papastavros T, Giamarellou H, Varlejides. Role of aerobic microorganisms in CSOM. Laryngoscope. 1986; 96: 438.

12-Palva T, Hallstrom O. Bacteriology of chronic otitis media. Archives of otolaryngology. 1965; 82: 359-364.

13-Jokipii AMM, Karmap, Ojala K and Jokipii L. Anaerobic bacteria in chronic otitis media. Archives of otolaryngology. 1977; 103: 278-280.

14-Ojala K, Sorri M, Rihakangas P, Spila P. Comparison of pre- and post operative bacteriology of chronic ears. Journal of laryngology and otology. 1981; 95: 1023-1029.

15-Sugita R, Kawamura S, Ichiakawa G, Goto S, Fugimaki Y. Studies on anaerobic bacteria in chronic otitis media. The laryngoscope. 1981; 91: 816-821.

16-Miro N. Controlled multicenter study on CSOM, treated with topical applications of ciprofloxacin. Otolaryngol Head and Neck-Surg. 2000; 123: 617-23.

17-Moshi NH et al. Bacteriology of chronic otitis media in Dares salaam, Tanzania. East-Afr-Med-J. 2000; 77: 20-2.

18-Tessema G. Otitis media seen in Yekatit 12 hospital. Ethiop-Med-J. 2001; 39: 113-21.

19-Paparella MM. The middle ear effusions. In: Paparella otolaryngology. 2nd edn. Saunders, 1980: 1473.

20-Supiyaphun P, et al. Comparison of floxacin otic solution with oral amoxicillin plus chloramphenicol ear drop in treatment of CSOM with acute exacerbation. J-Med-Assoc-Thai. 2000; 83: 61-8.

21-Browning G, Picozzi G, Calder IT and Sweeny G. Controlled trial of medical treatment of active otitis. BMJ. 1983; 278: 1024.

22-Browning GG. Medical management of chronic mucosal otitis media. Clinical Otolaryngology. 1984; 9: 141-144.

23-Alpert CM et al. Treatment of CSOM with topical tobramycin and dexamethasone. Arch-Otolaryngol-Head-Neck-Surg. 2000; 126: 165-73.

24-Hannley MT, Denney JC, Holzer SS. Use of ototopical antibiotics in treating 3 common ear diseases. Otolaryngol-Head-Neck-Surg. 2000; 122(6): 934-40.