Ototopical antiseptics in the treatment of active chronic otitis media

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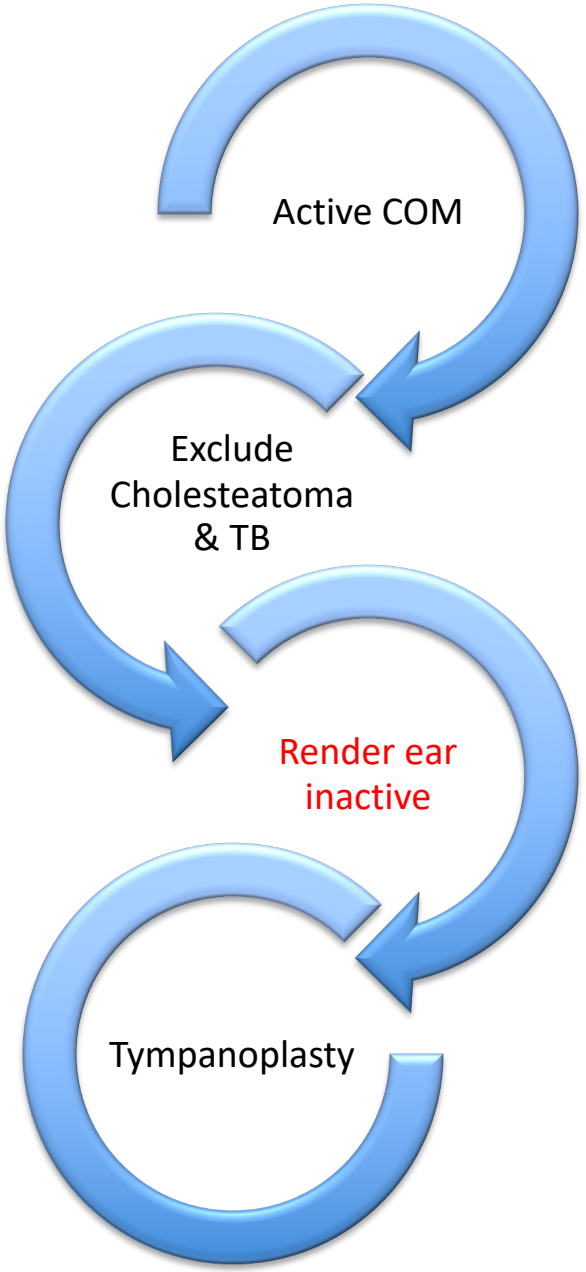

Active COM
Exclude Cholesteatoma & TB
Render ear inactive
Tympanoplasty

Overview

What works in active COM: the evidence

Properties of the ideal agent for active COM

2 studies we did on antiseptics in COM

The literature on antiseptic agents in COM

Treating active mucosal COM

Aural toilet vs topical antibiotics & steroids[1,2]

Topical antibiotics vs systemic[3,4, 5]

Topical quinolone drops, with/-out steroids[6, 7]

…… Antiseptic agents[8] ?

COM in South Africa

- Prevalence? But common
- DOH: 1% acetic acid & cotrimoxazole


Ideal agent
1
Effective against organisms
2
Nil microbial resistance
3
Nil ototoxicity
4
No adverse reactions
5
Inexpensive
6
No patient compliance
7
Ease of administration

STUDY N0 1:

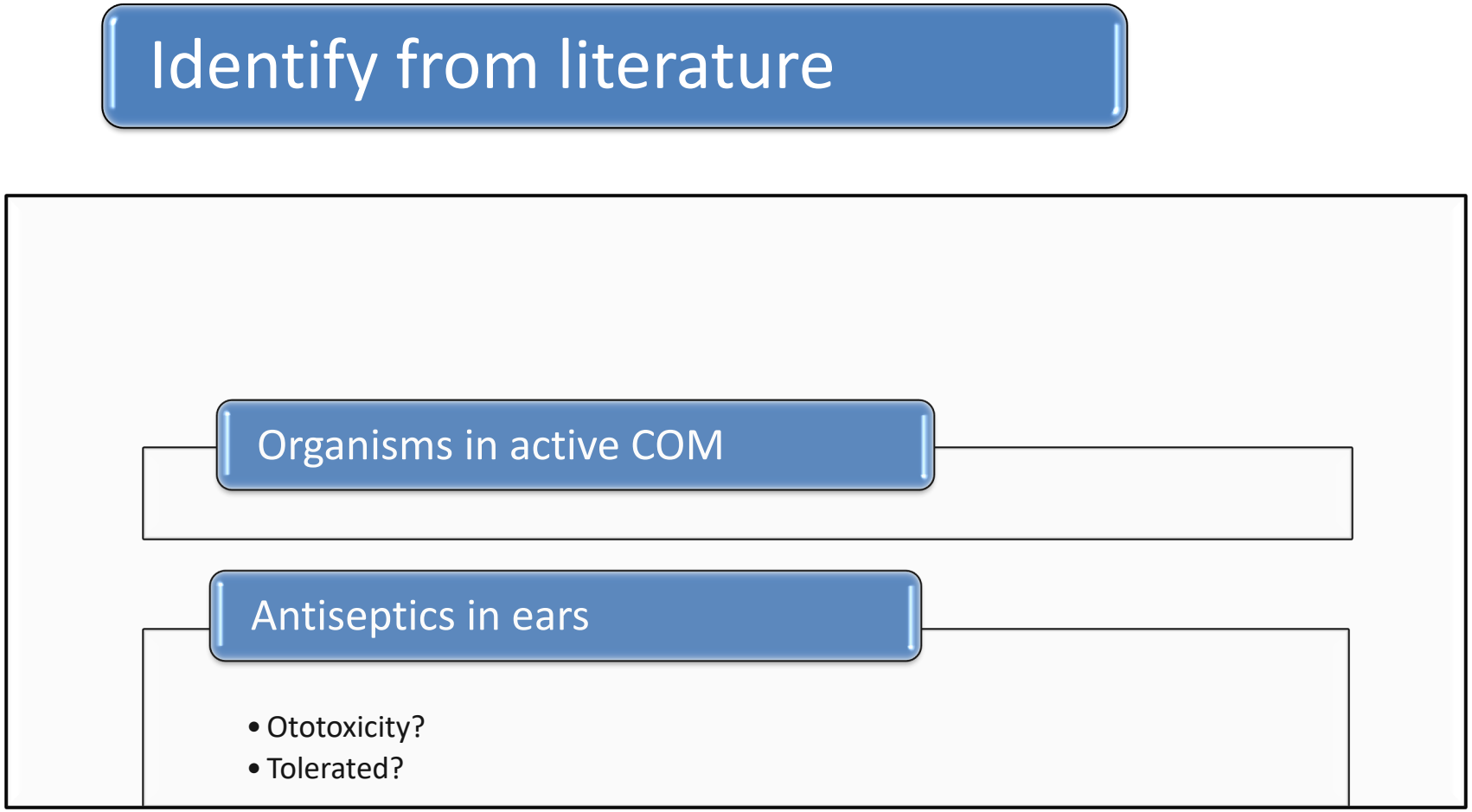
Aims

Examine potential ototopical antiseptics

Study effectiveness vs organisms in COM

- Compared to quinolone

Methods


Identify from literature
Organisms in active COM
Antiseptics in ears
• Ototoxicity?
• Tolerated?

Micro-organisms

Bacterial

- Pseudomonas aeruginosa
- Staphylococcus aureus
- Proteus spp
- Klebsiella spp
- Escherichia spp

Fungal

- Candida albicans
- Candida parapsillosis

Antiseptics

Powders

- Boric acid
- Iodine
- Boric acid / Iodine combo (1:1)

Benefits:

- **Once off administration**
- **Cost effective**
- **No need for patient compliance**

Solutions

- 2% Boric acid in H_2O
- 2% Acetic acid in H_2O
- 3,25% Aluminum acetate
- 5% Povidone Iodine

Benefits:

- **Easy mode of administration**

Methods

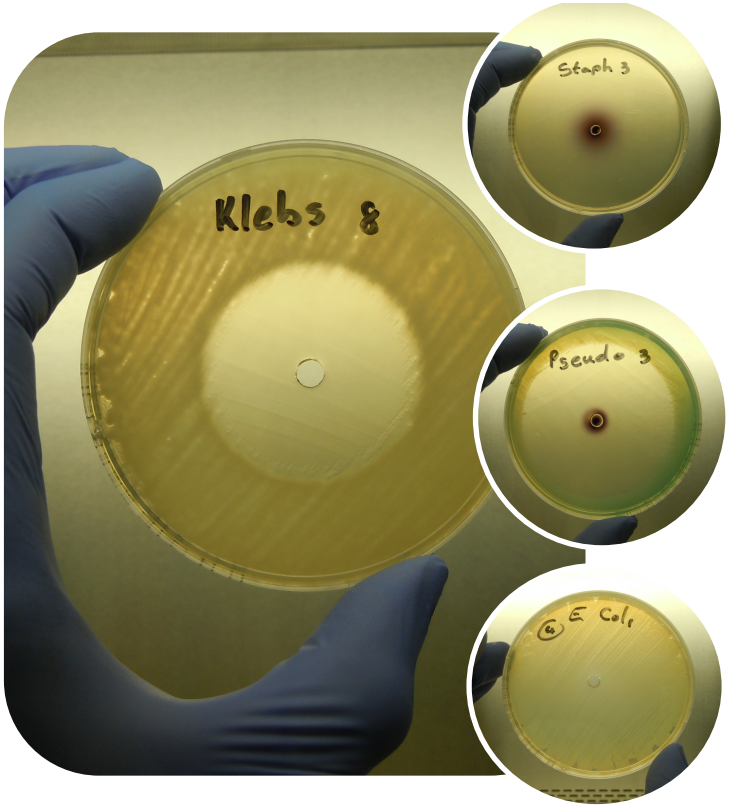
In vitro trial

- Agar plates
- Modified broth dilution (MIC)

In Vitro Trial:

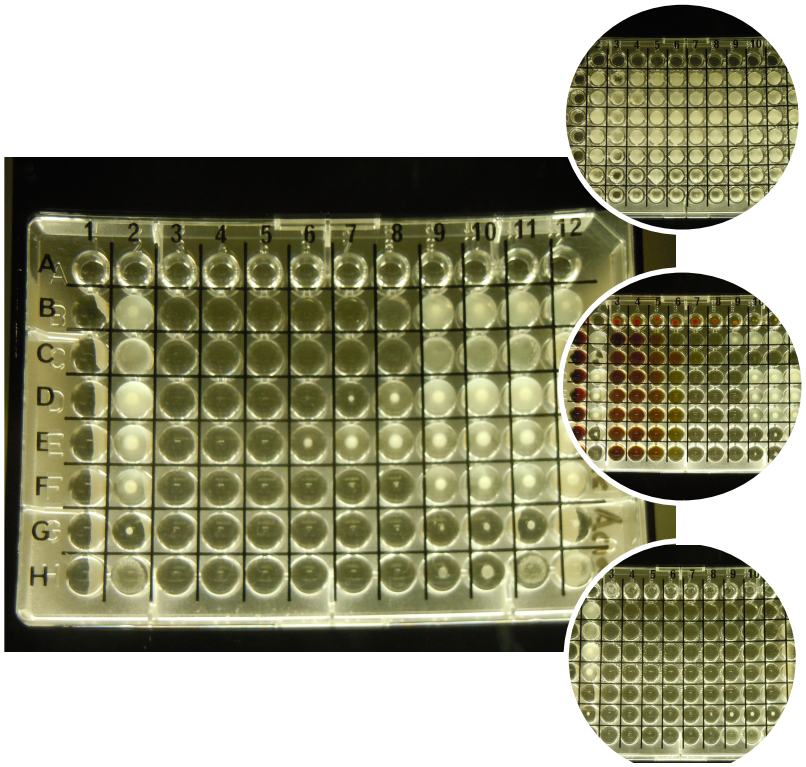
Agar plates

Powders



Modified broth dilution (MIC)

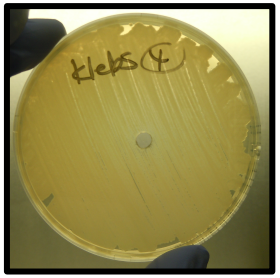
Solutions



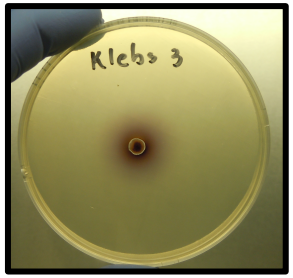
Results: Antiseptic powders:

Agar Plates

Powders	Pseudo	S. Aureus	Proteus	Klebs	E. Coli	C. Alb	C. Parap
✓ Boric acid	31	28	27	19	19	32	42
✗ Iodine	60	>80	69	>80	>80	>80	>80
✗ BA/I^- combo	54	>80	69	>80	>80	>80	>80
Iodine is intensely tissue toxic!							
Quinolone drops	35	41	38	35	39	14	14



0 mm
Nil inhibition



>80 mm
No growth

Results: Antiseptic solutions:

Modified Broth dilution

	1st	2nd	3rd	4th	5th	6th
Iodine (0,29%)	+	+	+	+	+	+
Boric acid (2%)	-	-	+ (0,25%)	+	+	+
Acetic acid (2%)	-	-	-	+ (0,125%)	+	+
Aluminum Acetate (3,25%)	-	-	-	+ (0,203%)	+	+
✓ Povidone Iodine (5%)	-	-	-	-	-	+ (0,078%)
Quinolone (0,3%)	-	-	-	-	-	+ (0,005%)

Conclusions

Quinolone
R16,74 ●
R233,70 ●●

Boric acid powder

N/A ●
R 0,44 ●●

5% Povidone Iodine

R 0,28 ●
R 0,89 ●●

Prices: ● State
●● Private

STUDY N0 2:

Acetic Acid Eardrops vs Ciprofloxacin Eardrops vs Boracic Acid Powder in Active Chronic Otitis Media

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AIM: Primary

- To investigate relative efficacies in active COM of:
  - 1% acetic acid (AA),
  - ciprofloxacin eardrops (CF) and
  - boracic acid powder (BAP)

METHOD:

Study design

- A prospective randomized controlled trial, partially blinded

METHOD:

Participants:

- ENT OPD, Tygerberg Hospital
  - Active COM over 6 years of age
  - Exclusion criteria: cholesteatoma;
    tuberculous otitis media;
    systemic disease (DM,HIV);
    ventilation tubes;
    aural polyps;
    previous ear surgery;
    recent treatment / antibiotics

METHOD:

Power, Randomisation and Blinding:

- Power calculated on pilot studies:150 pts
- Computer-generated randomized series
- Pharmacist provided numbered envelopes with allocated treatment

METHOD:

- Equipment & techniques kept "basic", as would be possible at 1° healthcare level:
  - Ambient light (no microscope/headlamp)
  - Toilet by syringing / dry mopping only


Tygerberg Hospital
N. GODLA

METHOD:

- Pus swab taken
- Tragal pump (AA, CF or Saline)
- Either:
  - Instructions (drops) or
  - BAP insertion
- All: No water in ears


PERTY

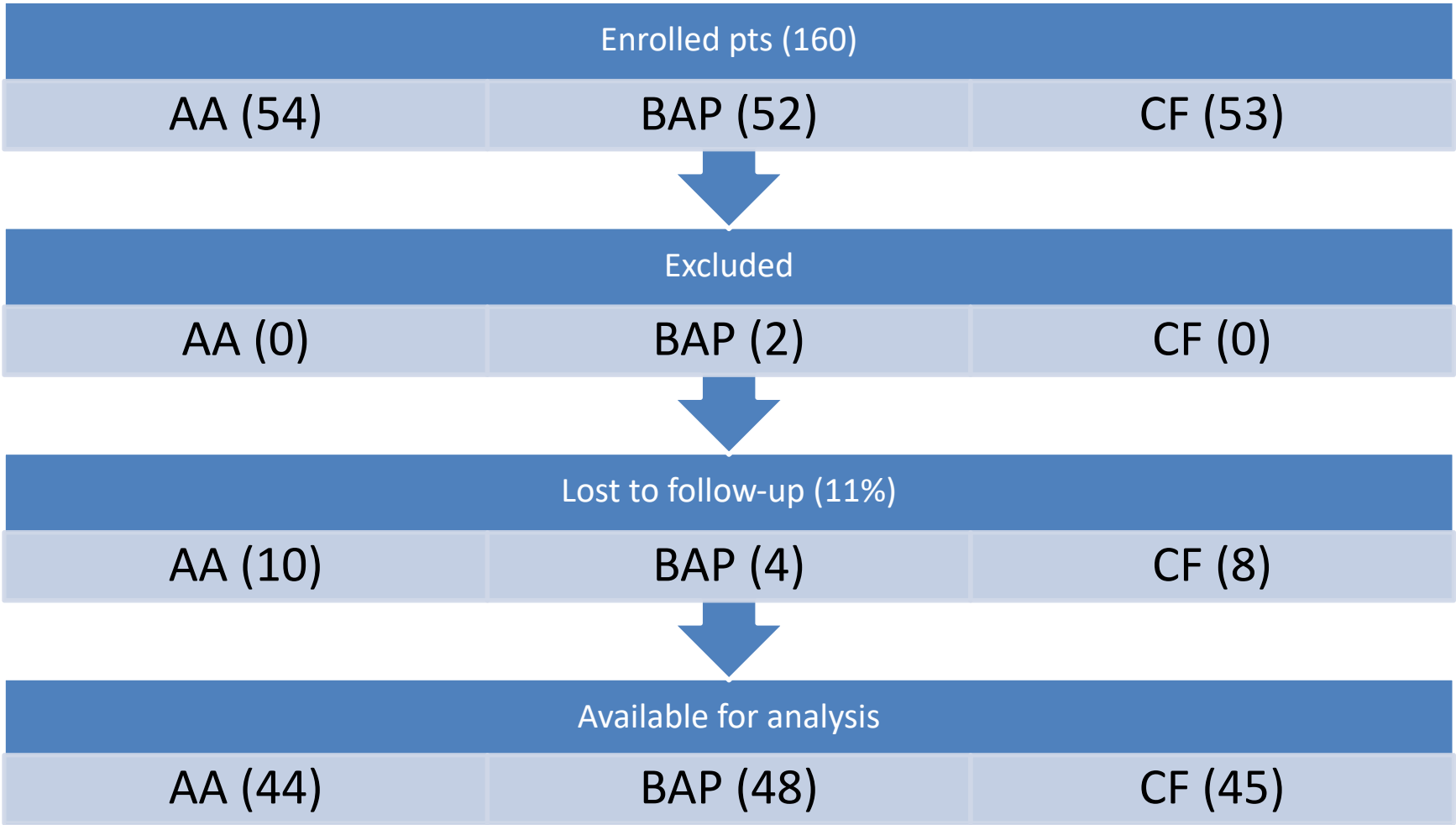
METHOD:

- Follow up in 1 month

- Assessment:
  - Ears inactive / moist / active
  - Adverse effects
  - Audiometry
  - Quadriderm if active (same “basic” technique)

- Repeat 1 month

RESULTS:


Enrolled pts (160)
AA (54)
BAP (52)
CF (53)
Excluded
AA (0)
BAP (2)
CF (0)
Lost to follow-up (11%)
AA (10)
BAP (4)
CF (8)
Available for analysis
AA (44)
BAP (48)
CF (45)

Boric acid powder

Table 3. Success of three first-line agents: clinician's assessment after 1 month

Agent	Randomised	Defaulted follow-up	Inactive*	'Moist'*	Active*
Acetic acid drops	54	10 (18%)	11 (25%)	5 (11%)	28 (64%)
Boric acid powder	52	3 (6%)	32 (65%)	8 (16%)	9 (18%)
Ciprofloxacin drops	53	8 (15%)	33 (73%)	7 (16%)	5 (11%)

*Number of ears; percentage of those ears attending follow-up.
(Chi-squared = 36.51, $P < 0.01$).

Loock JW. Clin Otolaryngol. 2012 Aug; 37(4): 261-70

Price comparison:

Agent	Price per unit	Price per patient
Acetic Acid 1% (5ml) DOH	R R 4.10	R R 4.10
Ciprofloxacin (5ml) (Clicks) Ofloxacin (5ml) (DOH)	R 149 R19.76	R 149 R19.76
Boracic Acid Powder 50g (Clicks) @1.5ml per patient; 33 pts	R 8.99	R 0.03

Conclusions:

- This study confirms ciprofloxacin eardrops as highly effective in active COM
  - Ofloxacin available very inexpensively to State

- Boracic acid powder as effective
  - It is extremely inexpensive
  - It requires no compliance
  - It can be effectively administered using no specialist equipment
  - It has no adverse side-effects

Conclusions:

- Acetic acid eardrops are ineffective
  - No justification for their continued use
  - Relative cost of agent, even quinolone, less than that of fruitless consultation

The literature: antiseptic agents in COM

Boric acid powder:

Loock JW, *Clin Otolaryngol* 2012 Aug; 37(4): 261-70:

- RCT, 160 patients
- BAP vs Quinolone eardrop vs 1% Acetic acid
- BAP as effective as quinolone; acetic acid ineffective

Chinese study:

- Similar results

Povidone iodine:

Jaya C et al, *Arch Otolaryngol Head Neck Surg* 2003; 129: 1098-1100

- RCT, 40 patients
- PVP-I vs ciprofloxacin eardrops
- Equivalence

Al-Abbasi A M, *JIMA* 2006; 38:118 – 121

- RCT, 48 patients
- PVP-I vs Neomycin-dexamethasone drops vs normal saline
- Success: 81% vs 69% vs 25%

Thank you

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7. Tong, MCF, van Hasselt C. A double-blind comparative study of ofloxacin otic drops versus neomycin-polymyxin B-hydrocortisone otic drops in the medical treatment of chronic suppurative otitis media. *Journal of Laryngology and Otology.* 1996; **110**: 309-14.
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