OTITIS EXTERNA

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OTITIS EXTERNA

- WIDE VARIETY OF PRESENTATIONS AND CLINICAL SIGNS
- ACUTE OTITIS EXTERNA VS CHRONIC OTITIS EXTERNA
- RECURRENT OTITIS EXTERNA
- CASE BASED APPROACH TODAY

2

CASE 1 – MORGAN – 3 YO F(S) LABRADOR RETRIEVER

3

CASE 1 – MORGAN – 3 YO F(S) LABRADOR RETRIEVER

- ACUTE ONSET OF HEAD SHAKING IN THE LAST 2 MONTHS
- NO PREVIOUS HISTORY OF OTITIS
- TRIZULTRA™ + KETO FLUSH WITH ENROFLOXACIN AND DEXAMETHASONE ADDED AND TREATED TWICE WEEKLY FOR 2 MONTHS
- SWIMS REGULARLY IN THE BACKYARD POOL (BUILT FOR THE DOGS!)

4

OTOSCOPIC EXAMINATION

- ABSOLUTELY NECESSARY
- INDICATIONS FOR TREATMENT OPTIONS
- POTENTIALLY IDENTIFY UNDERLYING CAUSE

5

OTOSCOPIC EXAMINATION

- EVALUATE AT RECHECK IN 2-3 WEEKS?
- PAINFUL EARS
- PURULENT OR CERUMINOUS DEBRIS
- BLOOD FILLED = MASS

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CASE 1 – MORGAN – 3 YO F(S) LABRADOR RETRIEVER

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LEFT EAR

RIGHT EAR

8

Vet Dermatol 2022; **33**: 208–e59 DOI: 10.1111/vde.13065

Caregiver burden, treatment complexity, and the veterinarian–client relationship in owners of dog with skin disease

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Conclusions and clinical importance – Findings support the notion that greater treatment complexity is related to the owner's perception of the veterinarian–client relationship via caregiver burden. Efforts to reduce caregiver burden by using the simplest effective treatment may benefit the veterinarian–client relationship.

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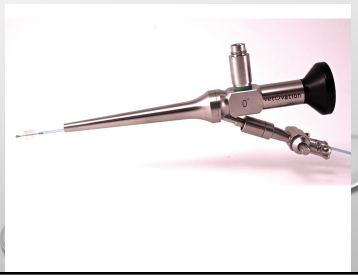
CASE 1 - MORGAN

- EAR CLEANING

10

EAR FLUSHING

- CLEANER ONLY
- CLEANER WITH COTTON BALL
- AURIFLUSH
- BULB SYRINGE
- RED RUBBER CATHETER
- VIDEO OTOSCOPY WITH PUMP FOR FLUSHING



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Comparative *in vitro* antimicrobial efficacy of commercial ear cleaners

Alison Swinney, Jennifer Fazakerley, Neil McEwan and Tim Nuttall

 19: 373–379

Table 1. Ear cleaners used in the study

Cleaner	Ingredients
Sancerum® (Schering Plough Animal Health)	Lactic acid 2.5% Salicylic acid 0.1% Parachlorometaxylenol (PCMX) 0.1% Docusate sodium and propylene glycol base
EpiOtic® Advanced Formula (Virbac Animal Health)	Salicylic acid 0.1% Parachlorometaxylenol (PCMX) 0.1% Disodium EDTA Docusate sodium and propylene glycol base Monosaccharides (l-rhamnose, d-galactose, d-mannose)
Cleanaural® Dog (Dechra Veterinary Products)	Boric acid Citric acid Isopropanol Propylene glycol
Cleanaural® Cat (Dechra Veterinary Products)	Glycerol Propylene glycol Polysorbate 80 Citric acid
Otoclean® (Janssen Animal Health)	Salicylic acid 0.22% Lactic acid 2.6% Oleic acid 0.264% Glycerin Propylene glycol Polyethylene glycol
Malacetic Otic® (Dermapet)	Acetic acid 2% Boric acid 2% Surfactant
Malacetic HC® (Dermapet)	Acetic acid 1% Boric acid 1% Hydrocortisone 1% Surfactant
Triz Plus® (Dermapet)	Tromethamine (Tris) Edetate disodium dihydrate (EDTA) Chlorhexidine 0.15%
TrizEDTA® (Dermapet)	Tromethamine (Tris) Edetate disodium dihydrate (EDTA)

Table 2a. Antimicrobial efficacy of various ear cleaners against *Staphylococcus intermedius*

	Mean CFU (n = 2) observed with serial dilutions of each ear cleaner								
	Control	1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256
Cleanaural® Dog	0	0	0	0	0	0	2.5	C	C
Sancerum®	0	0	0	0	0	C	C	C	C
Otoclean®	0	0	0	21	133.5	C	C	C	C
EpiOtic®	0	0	3	149.5	C	C	C	C	C
MalAcetic Otic®	0	0	49.5	C	C	C	C	C	C
TrizPlus®	0	0	C	C	C	C	C	C	C
Cleanaural® Cat	0	166	C	C	C	C	C	C	C
MalAcetic® HC	0	C	C	C	C	C	C	C	C
TrizEDTA®	0	C	C	C	C	C	C	C	C
PBS	0								
S. intermedius	C								

C, confluent growth; CFU, colony-forming units; PBS, phosphate-buffered saline.

Table 2b. Antimicrobial efficacy of various ear cleaners against *Pseudomonas aeruginosa*

	Mean CFU (n = 2) observed with serial dilutions of each ear cleaner								
	Control	1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256
Sancerum®	0	0	0	0	0	C	C	C	C
TrizPlus®	0	0	0	0	0	C	C	C	C
Cleanaural® Dog	0	0	0	0	6.5	C	C	C	C
EpiOtic®	0	0	0	0	C	C	C	C	C
Otoclean®	0	0	0	32	C	C	C	C	C
MalAcetic Otic®	0	0	15.5	C	C	C	C	C	C
MalAcetic® HC	0	79	C	C	C	C	C	C	C
Cleanaural® Cat	0	C	C	C	C	C	C	C	C
Triz EDTA®	0	C	C	C	C	C	C	C	C
PBS	0								
P. aeruginosa	C								

C, confluent growth; CFU, colony-forming units; PBS, phosphate-buffered saline.

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Vet **Background –** An antibiotic adjuvant is a chemical substance used to modify or augment the effectiveness of primary antimicrobial agents against drug-resistant micro-organisms. Its use provides an alternative approach to address the global issue of antimicrobial resistance and enhance antimicrobial stewardship.

Hypothesis/Objectives – To determine the antimicrobial activity of a panel of potential antimicrobial adjuvants against common pathogens associated with canine otitis externa (OE).

Animals/Isolates – A number of type strains and clinical isolates (n = 110) from canine OE were tested including *Staphylococcus pseudintermedius*, β-haemolytic *Streptococcus* spp., *Pseudomonas aeruginosa*, *Proteus mirabilis* and *Malassezia pachydermatis*.

Methods and materials – Antimicrobial activities of monolaurin, monocaprin, *N*-acetylcysteine (NAC), polymyxin B nonapeptide, Tris-EDTA, Tris-HCL and disodium EDTA were tested using microdilution methodology according to CLSI guidelines.

Results – *N*-acetylcysteine, Tris-EDTA and disodium EDTA had antimicrobial activity against both type strains and otic pathogens. The other adjuvants tested had limited to no efficacy. NAC had a minimal inhibitory concentration (MIC) range of 2,500–10,000 μg/mL for the various organisms. *Pseudomonas aeruginosa* isolates were eight times more susceptible to disodium EDTA in the presence of Tris-HCL in comparison to disodium EDTA alone. *Malassezia pachydermatis* isolates were most susceptible to Tris-EDTA (MIC_{90} = 190/60 μg/mL) and disodium EDTA (MIC_{90} = 120 μg/mL).

Conclusions and clinical relevance – *N*-acetylcysteine, Tris-EDTA and disodium EDTA have intrinsic antimicrobial activity and represent promising adjuvants that could be used to enhance the efficacy of existing antibiotics against Gram-negative and multidrug-resistant bacterial infections. These agents could be combined with other antimicrobial agents in a multimodal approach for mixed ear infections in dogs.

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The Efficacy of an Antiseptic and Microbial Anti-Adhesive Ear Cleanser in Dogs with Otitis Externa*

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CLINICAL RELEVANCE

A new antimicrobial ear cleanser was evaluated for the treatment of bacterial and yeast ear infections in dogs. Forty-five dogs with erythemato-ceruminous or purulent otitis externa were randomly allocated to two treatment groups: reference ear cleanser (Epiotic, Virbac) or test ear cleanser (Epiotic Advanced, Virbac). Ear cleansing was performed twice daily for 2 weeks, and no other treatment was allowed. By week 2, clinical (exudate quantity, erythema, stenosis, excoriation, and odor) and discomfort (pain, ear scratching, and head shaking) scores were significantly decreased ($P < .0001$ for all) and no microbial overgrowth could be detected in 25 (64.1%) and 32 (68.1%) ears treated with Epiotic and Epiotic Advanced, respectively. The new pH-balanced, propylene glycol–free test ear cleanser, which incorporates microbial adhesin-blocking carbohydrates, proved as effective as the reference acidic formula.

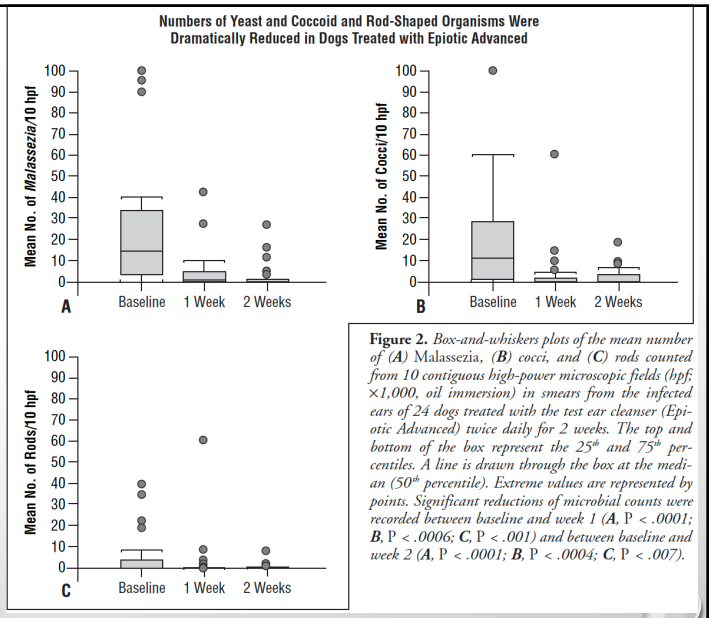

Figure 2. *Box-and-whiskers plots of the mean number of (A)* Malassezia, *(B) cocci, and (C) rods counted from 10 contiguous high-power microscopic fields (hpf; ×1,000, oil immersion) in smears from the infected ears of 24 dogs treated with the test ear cleanser (Epiotic Advanced) twice daily for 2 weeks. The top and bottom of the box represent the 25th and 75th percentiles. A line is drawn through the box at the median (50th percentile). Extreme values are represented by points. Significant reductions of microbial counts were recorded between baseline and week 1 (**A**, P < .0001; **B**, P < .0006; **C**, P < .001) and between baseline and week 2 (**A**, P < .0001; **B**, P < .0004; **C**, P < .007).*

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CASE 1 - MORGAN

- EAR CLEANING
- TREATMENT

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RELATIVE INSIGHT STUDY BY VIRBAC

- SOCIAL MEDIA SITES
- POSTS BY OWNERS AND VETERINARIANS
- COMPARE SOCIAL LANGUAGE ABOUT EAR INFECTIONS VS SOCIAL LANGUAGE IN GENERAL

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OWNERS DREAD AT-HOME TREATMENT EXPERIENCES

7.5X

Pet owners are 7.5x more likely to use terms of dislike when discussing treating their dog's ears

- *This affects the owner's ability and desire to be compliant with veterinarian recommendations and affects the pet owner's relationship with their pet*

> just made my dog yelp out in pain Bc I had to put her ear drop s in for this ear infection she fights literally every winter& I feel lik e the worst dog mom ever omg

> my dog tries to bite my entire hand off when I try to give him h is ear drops for his ear infection:)

> my little frenchie has an ear infection and she doesn't like me going near her ears to give her the drops ... I feel like the worst dog dad ever as I now wait until she's comfortably sleeping and then drop the medication in her ears. poor thing ...

> I have to give one of my dogs ear drops cause she has an ear i nfection and I hate it. she screams like i'm sawing a leg off and ev en though I know i'm not hurting her I think I am.

> my dog has to take ear drops for an ear infection that he has a nd I just spent ages trying to hold him down long enough to be a ble to get the drops into his ears,, I feel sorta bad Bc I know he d oes nt like it but its for his own health

> we cleaned out my dog's ears so he doesn't get an ear infection and he's so mad at us, he ran into his crate

Virbac Shaping the future of animal health

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SHORT-ACTING COMMERCIAL PRODUCTS

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LONG-ACTING COMMERCIAL PRODUCTS

SINGLE APPLICATION

- CLARO® (ELANCO)
  - FLORFENICOL, TERBINAFINE, MOMETASONE FUROATE
  - 30 DAYS EFFICACY
- SIMPLERA® (VETOQUINOL)
  - FLORFENICOL, TERBINAFINE, MOMET FUROATE
  - 30 DAYS EFFICACY
- MOMETAMAX SINGLE™ (MERCK)
  - GENTAMICIN, POSACONAZOLE, MOMETASONE FUROATE
  - 33 DAYS EFFICACY

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LONG-ACTING COMMERCIAL PRODUCTS

TWO APPLICATIONS (DAY 1 AND 7)

- OSURNIA® (DECHRA)
  - FLORFENICOL, TERBINAFINE, BETAMETHASONE ACETATE
  - 45 DAYS EFFICACY
- DUOTIC™ (DECHRA)
  - TERBINAFINE, BETAMETHASONE ACETATE
  - 45 DAYS EFFICACY

WEEKLY APPLICATIONS

- KC OTO-PACK™ (DERMAZOO)
  - KETOCONAZOLE, HYDROCORTISONE
  - WEEKLY INSTILLATIONS OF 1 ML

DAILY FOR 5 DAYS

- EASOTIC® (VIRBAC)
  - GENTAMICIN, MICONAZOLE, HYDROCORTISONE ACEPONATE
  - DAILY INSTILLATION FOR 5 DAYS → 15 DAYS ANTIMICROBIAL EFFICACY

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WAX PACKS

- BNT (ENROFLOXACIN, KETOCONAZOLE, TRIAMCINOLONE)
- UNKNOWN STABILITY
- OVERPACK POSSIBLE
- HEARING LOSS

21

VETERINARIANS CONSIDER COMPLIANCE A BIG PROBLEM

29.2X

Veterinarians are 29.2x more likely to discuss issues with compliance in following recommended treatment and rechecks

- *Issues with compliance lead to poor patient outcomes*

> I have a little yorkie patient that I've seen two times for ear infections in the same ear and both times I discussed Rechecks and she never came back. hopefully this time she will.

> for yeast only with no visible inflammation, I use Conzol, depending on owner compliance or ability to comply, I might add oral antifungal.

> they are suppose to use Ketotriz reg for both dogs-- owner compliance with cleaning is part of the issue. but yes I agree-- Triz with help. can't have...

> non compliance on the clients part is a huge issue. can't help but to get all judgey and what not. poor dog.

> these guys can escalate into chronic otitis just because of poor owner compliance , understandably so.

> recheck aren't just for money!

Virbac Shaping the future of animal health

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Evaluation of Owner Compliance with Topical Treatment of Acute Otitis Externa in Dogs: A Comparative Study of Two Auricular Formulations.

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Intern J Appl Res Vet Med • Vol. 9, No. 2, 2011

ABSTRACT

Objectives: This study compared owner compliance with two ear treatments: Surolan® (Janssen) 3-5 drops twice daily for 7 days, or Easotic® (Virbac), a pump application, once daily for 5 days.

Animals and Methods: Forty-two dogs with otitis in France and Germany were randomly assigned to receive Surolan® or Easotic®. Each product vial was weighed before and after the study on a precision balance to evaluate the doses actually given. In addition, the owners were asked to answer to a preset phone questionnaire.

Results: The mean ratio: number of doses actually administered/number of doses prescribed, was 1.06 with Easotic® and 0.8 with Surolan®. The ratio was less variable in the Easotic® group (Standard Deviation=0.34, Coefficient of Variation=32%) than in the Surolan® group (SD=0.68, CV=85%). The variance of the ratio was significantly different between the groups (0.13 vs 0.47, p=0.0081). Only 10% of owners stated they were able to count exactly the number of Surolan® drops. More owners in the Easotic® group (100%) than in the Surolan® group (78.9%) positively rated the product frequency of use (p=0.0424 between the groups). More dogs were subjectively rated by veterinarians as having considerably improved after treatment with Easotic® (p=0.0033 between groups).

Clinical significance: Data from this study suggest that a simplified dosing regimen and method of administration improved owner treatment compliance in canine otitis externa.

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Table 2. Number of owners with objective measurement of compliance (compliance ratio) outside the normal range and possible reasons identified.

Non-compliance issue	Easotic® N=19	Surolan® N=19
Nb (%) of non-compliant owners: Compliance ratio outside the normal range (<0.7 or >1.3)	4/19 (21.1%)	15/19 (78.9%)
Possible reasons for lack of compliance		
Missed doses reported by non-compliant owners	0/4	2/15
Difficulty in applying the right dose reported by non-compliant owners*	0/4	14/15
Wrong frequency or duration of treatment applied by non-compliant owners	0/4	1/15
Misunderstanding of the medical condition being treated** by non-compliant owners	2/4	5/15
Non-compliant owners subjectively rated as moderately reliable by the veterinarian	1/4	3/15†

**owner unable to apply one pressure (Easotic® group) or to count exactly the number of drops prescribed by the veterinarian (Surolan® group); **owner unable to name the medical problem for which the dog is being treated (otitis); † One investigator has no idea.*

Table 3. Subjective assessment of owners and veterinarians on product features related to compliance.

Parameter	Easotic®	Surolan®	Between-group comparison (P-value)
Owners opinion	n=21	n=20	
Satisfied with at least one positive feature of the product as relates to product use	20 (95.2%)	14 (70%)	0.0448
Dissatisfied with at least one negative feature of the product as relates to product use	4 (19%)	10 (50%)	0.0516
Satisfied with duration of treatment	v21 (100%)	17 (85%)	0.1069
Satisfied with frequency of treatment	21 (100%)	15 (75%)	0.0424
Globally satisfied with the product	21 (100%)	17 (85%)	0.1069
Veterinarians opinion	n=21	n=21	
Satisfied with product easiness of use	19 (90.5%)	9 (45%)*	0.0025

** One opinion missing (n=20)*

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CASE 1 - MORGAN

- TREATMENT LENGTH?

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DIVERSITY OF EARS

- VARIETY OF TREATMENT VOLUMES

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Finite element modelling of the canine and feline outer ear canal: benefits for local drug delivery?

Finite Element Modell des kaninen und felinen Außenohrs: Nutzen für die lokale Medikamentenapplikation?

Patrick Wefstaedt[1], Bernd-Arno Behrens[2], Ingo Nolte[1], Anas Bouguecha[2]

TABLE 1: *Baseline characteristics of the dogs (d) and cats (c) used for the generation of the FEM including data of the calculated area and volume of the CT-examined ear, determined (det.) outer ear (OE) volume after application of contrast media, recommended (rec.) and necessary (nec.) amount of drops of Surolan® to moisten the OE area*

Breed (dog/cat)	Weight (kg)	Age (years)	Ear	FEM: OE area (cm^2)	FEM: OE volume (cm^2)	Det. OE volume (cm^2)	Rec. drops Surolan®	Nec. drops Surolan®
Hybrid (d)	1,15	0,3	right	12.145	1.975	2	3-5	2-3
Shi-Tzu (d)	5,4	4	right	20.082	4.478	4.5	3-5	4
Jack Russel Terrier (d)	10	8	right	28.584	6.520	6.6	3-5	5-6
Hybrid (d)	20	12	left	38.455	9.607	9.8	3-5	7-8
European short hair (c)	3	1,5	left	19.312	4.146	4.1	3-5	3-4
European short hair (c)	2,8	1	right	16.07	3.122	3.2	3-5	3-4

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CASE 1 - MORGAN

- EAR CLEANING
- TREATMENT
- SWIMMING

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CASE 1 - MORGAN

- TREATMENT
  - CLEANED IN CLINIC WITH EPI-OTIC ADVANCED
  - EASOTIC® (GENTAMICIN, MICONAZOLE, HYDROCORTISONE ACEPONATE) IN BOTH EARS ONCE DAILY FOR 5 DAYS
- RECHECK IN 2 WEEKS - RESOLVED
- MONITOR FOR RECURRENCE OF OTITIS IN THE FUTURE

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CASE 2 – MAMA BOSS - 4 YO F(S) PITBULL TERRIER

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LEFT EAR

RIGHT EAR

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CASE 2 – MAMA BOSS

- EAR CLEANING

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Comparative *in vitro* antimicrobial efficacy of commercial ear cleaners

Alison Swinney, Jennifer Fazakerley, Neil McEwan and Tim Nuttall

 19; 373-379

Table 2c. Antimicrobial efficacy of various ear cleaners against *Malassezia pachydermatis*

		Mean CFU (n = 2) observed with serial dilutions of each ear cleaner							
	Control	1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256
Cleanaural® Dog	0	0	0	0	0	0	56	C	C
Otoclean®	0	0	0	0	106	C	C	C	C
Sancerum®	0	0	0	0	118	C	C	C	C
EpiOtic®	0	0	0	0	156	C	C	C	C
TrizPlus®	0	0	0	0	C	C	C	C	C
MalAcetic Otic®	0	0	0	147.5	C	C	C	C	C
Cleanaural® Cat	0	146	C	C	C	C	C	C	C
MalAcetic® HC	0	C	C	C	C	C	C	C	C
Triz EDTA®	0	C	C	C	C	C	C	C	C
PBS	0								
M. pachydermatis	C								

C, confluent growth; CFU, colony-forming units; PBS, phosphate-buffered saline.

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Vet Dermatol 2013; **24**: 362–e81 DOI: 10.1111/vde.12024

Study to assess *in vitro* antimicrobial activity of nine ear cleaners against 50 *Malassezia pachydermatis* isolates

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Background – Ear cleaning is an important part of the successful therapy of otitis externa.

Hypothesis/Objectives – To evaluate the *in vitro* activity of nine commercially available ear cleaners (Cerumaural®, CleanAural Dog®, Epi-Otic®, MalAcetic Aural®, Otoclean®, Otodine®, Sancerum®, Surosolve® and TrizUltra™ + Keto) against 50 *Malassezia pachydermatis* isolates from clinical cases of canine otitis externa. To the authors' knowledge, this is the first study to analyse the *in vitro* susceptibility of a large number of *M. pachydermatis* isolates to a variety of ear cleaner products.

Animals – Forty-nine hospital population dogs diagnosed with otitis externa with *Malassezia* spp. present on cytological examination of ear swabs and culture.

Methods – The antimicrobial activity of nine ear cleaners was tested against 50 *M. pachydermatis* isolates from 49 clinical cases of canine otitis externa using an *in vitro* agar diffusion test.

Results – There were statistically significant differences in activity between ear cleaners, with five showing excellent *in vitro* anti-*Malassezia* activity (CleanAural Dog®, Epi-Otic®, MalAcetic Aural®, Sancerum® and TrizUltra™ + Keto), two moderate activity (Otodine® and Surosolve®), one variable activity (Otoclean®) and one no activity (Cerumaural®). There was a significant overall difference in susceptibility between *M. pachydermatis* isolates tested ($P < 0.001$).

Conclusions and clinical importance – Ear cleaners with activity against *Malassezia* may help to reduce the unnecessary use of antibiotic-containing polypharmaceutical ear medications. This study shows that the use of a large number of isolates may provide a more accurate account of the *in vitro* activity of a product.

CleanAural Dog® (Dechra Veterinary Products)	Propylene glycol Isopropyl alcohol Tromethamine Citric acid L-Menthol Chlorothymol	6.3
Epi-Otic® Ear cleaner Advanced formula (Virbac Animal Health, Bury St Edmonds, UK)	0.1% Salicylic acid 0.1% PCMX 0.5% EDTA DOSS Monosaccharides (L-rhamnose, D-galactose, D-mannose)	6.9
MalAcetic Aural® (Dechra Veterinary Products)	2% Acetic acid 2% Boric acid	4.4
Sancerum® (MSD Animal Health, Milton Keynes, UK)	2.5% Lactic acid 0.1% Salicylic acid 0.1% PCMX DOSS Propylene glycol	2.5
TrizUltra™ + Keto Otic flush (Dechra Veterinary Products)	Tris–EDTA 0.15% Ketoconazole	8.1

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CASE 2 – MAMA BOSS

- EAR CLEANING
- TREATMENT

35

TREATMENT

- TOPICAL ANTIFUNGAL
- TOPICAL STEROID MONOTHERAPY?

36

Efficacy
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Abstract

Background: Erythemato-ceruminous otitis externa (ECOE) is frequently seen in dogs affected with an allergic skin disease, with recurrent secondary bacteria and yeast overgrowths (detected on cytological examination).

Objectives: The objective of the study was to compare the efficacy and safety of an ear spray containing only hydrocortisone aceponate glucocorticoid diester (HCA) to a control product (CTRL), an approved otic formulation containing prednisolone-miconazole-polymyxin combination, in dogs with ECOE.

Animals: In total, 97 and 104 dogs with ECOE were respectively randomly assigned to the tested ear treatment product group (HCA) or the commercially available ear treatment control product group (CTRL).

Materials and Methods: Dogs were treated for 7–14 days, as needed. At Day (D)0, D7, D14, D28 and D42, Otitis Index Score-3, hearing test, pruritus and pain visual analogue scales, and cytological scores were graded. The overall response to treatment also was assessed.

Results: All clinical parameters decreased rapidly and in a similar way without any significant difference at any time between treatment groups. A good-to-excellent response to treatment was seen in >90% of dogs of both groups as early as D14. The treatment was considered safe in all dogs.

Conclusions and Clinical Relevance: A 7- to 14-day ear topical application of HCA alone to dogs with ECOE accompanied with bacterial and/or fungal (yeast) overgrowth was safe and led to no statistical difference in improvement of clinical scores relative to the CTRL combination. Based on these results, it may be necessary to reconsider the routine use of antimicrobial drugs such as antibiotics and antifungals as a first-line treatment for ECOE that is likely to have been caused by an allergic reaction.

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When only yeast overgrowth was recorded on D0, the mean yeast cytological scores decreased from 2.6 to 1.2 and 2.6 to 1.7 on D28, respectively, in the HCA and CTRL groups.

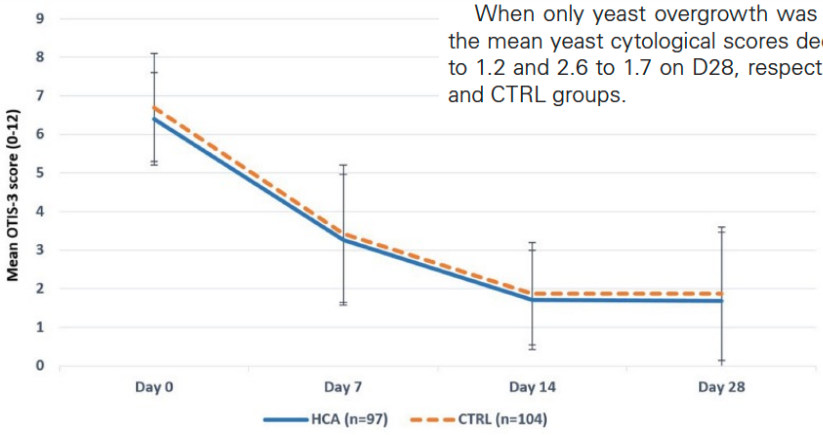

FIGURE 1 Evolution of Otitis Index Score (OTIS)-3 scores over time in both groups. Data presented are the means±SDs. Blue line, hydrocortisone aceponate (HCA) ear spray solution; orange dotted line, prednisolone acetate-polymyxin B-miconazole ear drop suspension combination (CTRL).

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CASE 2 – MAMA BOSS

- EAR CLEANING
- TREATMENT
- RECURRENCE OR LACK OF RESOLUTION?

39

40

Veterinary Dermatology

Vet Dermatol 2021; **32**: 441–e119 DOI: 10.1111/vde.12995

Malassezia otitis unresponsive to primary care: outcome in 59 dogs

Johann M. Boone, Ross Bond, Anette Loeffler, Ewan A. Ferguson and Anke Hendricks

Background – Otitis externa (OE) is a common disorder in dogs. Infection by the commensal yeast, *Malassezia pachydermatis*, may result in chronic disease that does not respond to standard primary care. Chronic infectious OE may be associated with otitis media (OM).

Hypothesis/Objective – To report medical management, clinical outcomes and frequency of middle ear involvement, in dogs with *Malassezia* otitis unresponsive to primary care.

Animals – Fifty-nine dogs from one referral veterinary hospital from January 2007 to September 2018.

Methods and materials – Retrospective analysis of medical records of dogs referred with chronic otitis and treated for *Malassezia* otitis at a referral veterinary hospital.

Results – Chronic *Malassezia* OE was treated successfully in 91% of ears, in 87% of these cases with one ear flush intervention. Median time-to-resolution was 27 days after ear flush intervention. Neither duration of otitis, presence of neutrophils in aural discharge nor administration of oral itraconazole affected clinical outcome. *Malassezia* OM occurred concurrently in 17% of ears.

Conclusions and clinical relevance – These findings assist clinicians and carers of affected dogs in decision-making, by documenting that most cases of canine *Malassezia* otitis that have not resolved with standard primary care, can be treated successfully with a well-staged and intense medical treatment plan. *Malassezia* OM should be suspected to occur concurrently in around a fifth of affected ears.

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CASE 2 – MAMA BOSS - 4 YO F(S) PITBULL TERRIER

- DEEP EAR FLUSH PERFORMED TO REMOVE CERUMINOLITH
- COMPOUNDED CLOTRIMAZOLE/DEXAMETHASONE SOLUTION - 2 WEEKS
- NO RECURRENCE OVER 2 YEARS

42

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CASE 3 – GRACIE – 8 YO F(S) YORKSHIRE TERRIER

- SEVERAL YEAR HISTORY OF PRURITUS OF THE EARS AND SHAKING THE HEAD
- PREVIOUSLY RESPONDED TO TOPICAL THERAPY (MOMETAMAX, CLARO, EASOTIC)
- HISTORY OF ATOPIC DERMATITIS AND TREATED WITH CYTOPOINT

44

CASE 3 – GRACIE – 8 YO F(S) YORKSHIRE TERRIER

45

LEFT EAR

RIGHT EAR

46

CASE 3 - GRACIE

- EAR CLEANING
- TREATMENT

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Vet Dermatol 2021; **32**: 168–e39 DOI: 10.1111/vde.12924

Preliminary study of the stability of dexamethasone when added to commercial veterinary ear cleaners over a 90 day period

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Correspondence: Carolyn Emery, William R. Pritchard Veterinary Teaching Hospital, School of Veterinary Medicine, University of California Davis, 1 Garrod Drive, Davis, CA 95616, USA.
E-mail: cemery@sgu.edu

Background – Topical corticosteroids are commonly used in the management of allergic otitis externa to diminish inflammation. A common strategy is to make compounded solutions of dexamethasone in ear cleaner.

Hypothesis/Objectives – The objective of this study was to determine the stability of dexamethasone when added to four commercial ear cleaners (ec): designated ecA, ecB, ecC and ecD.

Methods and Materials – Two concentrations (0.1 and 0.25 mg/mL) of dexamethasone were formulated for each cleaner solution from a 2 mg/mL solution and stored in the original manufacturers' bottles at two temperatures: room (22 °C) and refrigerated (4 °C). Samples were evaluated in triplicate, using liquid chromatography-tandem mass spectrometry at 10 time points over 90 days. The mean and standard deviation were calculated for each time point.

Results – A solution was considered stable if the dexamethasone value remained >90% of the target concentration. All dexamethasone solution values were stable to 90 days, except two solutions for ecA; the 0.25 mg/mL dexamethasone concentration was only stable to 14 (4 °C) and 21 days (22 °C).

Conclusions and clinical importance – These results provide preliminary evidence in support of pharmaceutical stability data for dexamethasone when included in the above compounded solutions at the noted concentrations and temperatures.

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Remember Morgan?!?!?!

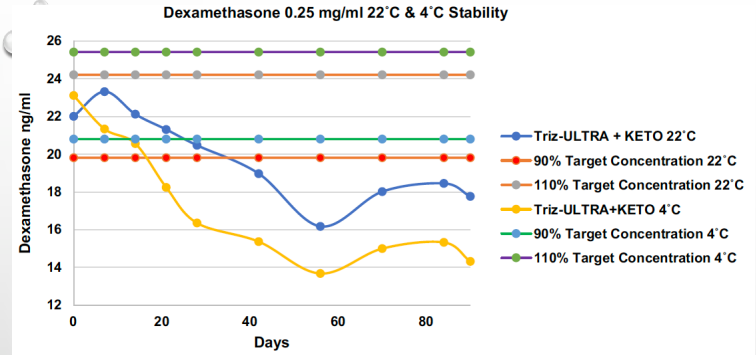

Figure 1. Stability of dexamethasone over time and at different temperatures when compounded with Triz-ULTRA + KETO Flush ear cleaner. Triz-ULTRA + KETO Flush ear cleaner with 0.25 mg/mL (2 mg/mL) dexamethasone is only stable until Day 21 at room temperature (22 °C) and until Day 14 at refrigerator temperature (4 °C).

1 ecA: Triz-ULTRA + KETO Flush. Active ingredients: 0.15% ketoconazole, TrizEDTA (tromethamine USP, disodium EDTA dihydrate). Other ingredients: deionized water, carbopol aqua (lot 171190, expiration 10/19, store at room temperature).

2 ecB: MAL-A-KET Plus TrizEDTA Flush. Active ingredients: 0.15% chlorhexidine gluconate, 0.15% ketoconazole, TrizEDTA (tromethamine USP, disodium EDTA dihydrate). Other ingredients: deionized water, carbopol aqua, hydantoin and glycolic acid (lot 171056, expiration 09/19, store at room temperature).

3 ecC: Epi-Otic Advanced. Active ingredient: salicylic acid 0.2%. Other ingredients: disodium EDTA, docusate sodium, PCMX, a monosaccharide complex (L-rhamnose, D-galactose, D-mannose) and FD&C Blue #1 (lot 160550, expiration 11/2018).

4 ecD: Douxo Micellar Solution. Active ingredient: phytosphingosine HCl 0.02%. Other ingredients: water, polysorbate 80, alcohol denatured, propylene glycol, laureth-9, poloxamer 184, biosaccharide Gum-2, imidazolidinyl urea, phenoxyethanol, potassium sorbate, citric acid and fragrance (lot 170585A, expiration 02/06/19, store at room temperature).

Dexamethasone 2 mg/mL – 5.9 mL or 14.8 mL into 4 ounce bottle of Epi-Otic Advanced and MAL-A-KET Plus TrizEDTA

Dexamethasone 2 mg/mL – 6.2 mL or 15.5 mL into Douxo Micellar Solution

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Vet Dermatol 2021; **32**: 355–e98 DOI: 10.1111/vde.12977

Preventive use of a topical anti-inflammatory glucocorticoid in atopic dogs without clinical sign of otitis does not affect ear canal microbiota and mycobiota

Background – Otitis externa is associated with a lack of bacterial/fungal diversity in atopic dermatitis. Clinical experience has shown that use of topical corticosteroids in the ear canal (EC) can prevent otitis. No data are available on the impact of this treatment on the EC microbiota.

Hypothesis/objectives – To observe the bacterial/fungal diversity in the EC and the clinical effect of topical corticosteroids administered over a four week period in atopic dogs without active otitis.

Animals – Ten atopic dogs without active otitis.

Methods and materials – Mometasone was applied in the right EC, while the left was used as control. A clinical and cytological evaluation of the EC was performed. Swabs of each EC were analysed using next-generation sequencing methods.

Results – At the beginning of the trial, variations in microbiota and mycobiota were observed between dogs and also within individuals. Statistically, no significant difference was observed in alpha and beta diversity between the treated and the untreated group over time. Clinically, right and left EC diversities were no different at Day (D) 28 ($P = 0.28$). A significant difference was noted between D0 and D28 for the treated ears ($P = 0.012$) and not for the untreated ears ($P = 0.63$). No cytological evidence of microbes was found for treated ECs at D28.

Conclusions and clinical relevance – These data suggest that the use of topical corticosteroids as proactive treatment is unlikely to increase the risk of secondary microbial overgrowth. The positive clinical effect of this proactive treatment seems to be supported through cytological and otoscopic improvement.

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CASE 3 - GRACIE

- ROUTINE EAR CLEANING
- TREATMENT
  - DEXAMETHASONE (0.1%) IN EPI-OTIC ADVANCED 2 TIMES WEEKLY FOR 3 WEEKS AND THEN WEEKLY AFTERWARDS
- WHY IS THE EAR CANAL INFLAMED?
  - ATOPIC DERMATITIS → TREATED WITH CYTOPOINT

51

CASE 4 – BRUNO – 6 YO M(N) COCKER SPANIEL

- RECURRENT OTITIS EXTERNA FOR ABOUT 4 YEARS
- RESOLVES WITH TREATMENT, RETURNS IN A FEW MONTHS
- CURRENT INFECTION NOT RESOLVING WITH THERAPY
  - CLARO, BAYTRIL OTIC
- APOQUEL FOR ATOPIC DERMATITIS

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CASE 4 – BRUNO – 6 YO M(N) COCKER SPANIEL

53

LEFT EAR

RIGHT EAR

54

CASE 4 - BRUNO

- NON-RESPONSIVE TO CURRENT THERAPY
  - CLARO (FLORFENICOL), ENROFLOXACIN
- WHAT BACTERIAL ORGANISM? PSEUDOMONAS?

55

IDENTIFICATION OF BACTERIAL ORGANISM

- GRAM STAIN - CAN BE HELPFUL TO IDENTIFY ORGANISM IN SOME CASES
- BENEFICIAL TO BETTER VISUALIZE GRAM POSITIVE ORGANISMS

Organism	Shape	Grouping	Gram Stain
Staphylococcus spp.	Cocci	Pairs or clusters	Gram positive
Streptococcus spp.	Cocci	Pairs or chains	Gram positive
Pseudomonas spp.	Rod	Single	Gram negative
Proteus spp.	Rod	Single	Gram negative
Enterococcus spp.	Cocci	Pairs or chains	Gram positive
Corynebacterium spp.	Rod to club shaped	Clustered, V forming, Chinese characters	Gram positive
Escherichia coli	Rod	Single	Gram negative
Pasteurella spp.	Coccobacillus	Single	Gram negative

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ANTIMICROBIAL SUSCEPTIBILITY

Organism	Sensitive	Resistant
Staphylococcus spp.	Amikacin, Gentamicin, Fluoroquinolones	Penicillins
Streptococcus spp.	Gentamicin, Fluoroquinolones	Amikacin
Pseudomonas spp.	Gentamicin, Amikacin, Enrofloxacin (intermediate)	Penicillins, Clindamycin, Sulfonamides, Chloramphenicol, Tetracyclines
Proteus spp.	Amikacin, Gentamicin, Enrofloxacin	Penicillins, Clindamycin, Tetracyclines,
Enterococcus spp.	Penicillins, Enrofloxacin	Aminoglycosides, Clindamycin, Amikacin
Corynebacterium spp.	Aminoglycosides, Fluoroquinolones	
Escherichia coli	Amikacin, Enrofloxacin	Penicillins, Clindamycin
Pasteurella spp.	Gentamicin	Clindamycin

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CASE 4 - BRUNO

- NON-RESPONSIVE TO CURRENT THERAPY
  - CLARO (FLORFENICOL), ENROFLOXACIN
- WHAT BACTERIAL ORGANISM? PSEUDOMONAS?
- CULTURE AND SUSCEPTIBILITY TESTING

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Vet Dermatol 2019; **30**: 139–e40 DOI: 10.1111/vde.12717

In vitro antimicrobial activity of topical otological antimicrobials and Tris-EDTA against resistant *Staphylococcus pseudintermedius* and *Pseudomonas aeruginosa* isolates from dogs

Megan Boyd, Domenico Santoro and Dunbar Gram

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Background – The value of susceptibility tests for the selection of topical otological antimicrobial agents is unclear. Laboratories test antibiotic concentrations substantially lower than concentrations supplied in topical formulations. Additionally, microbiological consensus statements are not available for topical antimicrobials.

Hypothesis/Objectives – The primary aim of this study was to measure the minimum inhibitory (MIC) and bactericidal (MBC) concentrations of enrofloxacin, gentamicin, marbofloxacin, neomycin, orbifloxacin, polymyxin B and silver sulfadiazine (SSD) from concentrations available in otological formulations (COF) to 1:59,000 dilution. The secondary aim was to evaluate the effect of Tris-EDTA in conjunction with these antimicrobial agents.

Methods and materials – Twenty resistant clinical isolates [*Staphylococcus pseudintermedius* (n = 10) and *Pseudomonas aeruginosa* (n = 10)] were tested by broth microdilution using a concentrated inoculum (3.75×10^7 cfu/mL).

Results – Concentrations available in otological formulations were at least 26× greater than the MICs for *S. pseudintermedius* and *P. aeruginosa*. COFs of polymyxin B and SSD were 27× greater than the MBCs for *P. aeruginosa*, whereas all other antimicrobial COFs were equal to or less than the MBCs for both organisms. Tris-EDTA significantly reduced the MICs of all antimicrobials, except with SSD for *P. aeruginosa*, and it significantly increased the MIC of SSD for *S. pseudintermedius*.

Conclusions and clinical importance – Further studies are warranted to validate the present results *in vivo*. COFs are inhibitory and less likely bactericidal, with few exceptions, against resistant strains of these organisms. Tris-EDTA may be advantageous for *P. aeruginosa* whereas no additional benefit is afforded against *S. pseudintermedius*. Susceptibility tests may not be useful for the selection of topical otological antimicrobial agents.

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Correlation between topical antibiotic selection, *in vitro* bacterial antibiotic sensitivity and clinical response in 17 cases of canine otitis externa complicated by *Pseudomonas aeruginosa*

D.C. Robson[1], G.G. Burton[1], R.J. Bassett[1]
Animal Skin Ear and Allergy Clinic, Melbourne Veterinary Specialist Centre, Melbourne, Victoria, Australia

- 20 AFFECTED EARS WITH 17 HAVING FOLLOW-UP
- 11/17 REPORTED RESISTANT TO EMPIRICALLY CHOSEN ANTIBIOTIC
  - 10/11 SUCCESSFULLY TREATED; 1 FAILED TO RESPOND AND SWITCHED TO ANOTHER RESISTANT AB AND RESPONDED
- 6/17 REPORTED SUSCEPTIBLE TO EMPIRICALLY CHOSEN ANTIBIOTIC
  - 1/6 FAILED TO RESPOND TO SUSCEPTIBLE AB AND SWITCHED TO RESISTANT AB AND RESOLVED

60

BIOFILMS

- INCREASING DISCUSSION
- FORM AN ADHERENT, THICK AND SLIMY DISCHARGE
- PREVENT PENETRATION OF ANTIMICROBIALS
- PROTECTED RESERVOIR OF BACTERIA
- ANTIBIOTICS REQUIRING BACTERIAL DIVISION ARE LESS EFFECTIVE

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BIOFILMS

- VETERINARY DISEASES
  - PURULENT OTITIS
  - MALASSEZIA DERMATITIS
  - BACTERIAL OVERGROWTH
  - HOT SPOT
  - CHRONIC NON-HEALING WOUND

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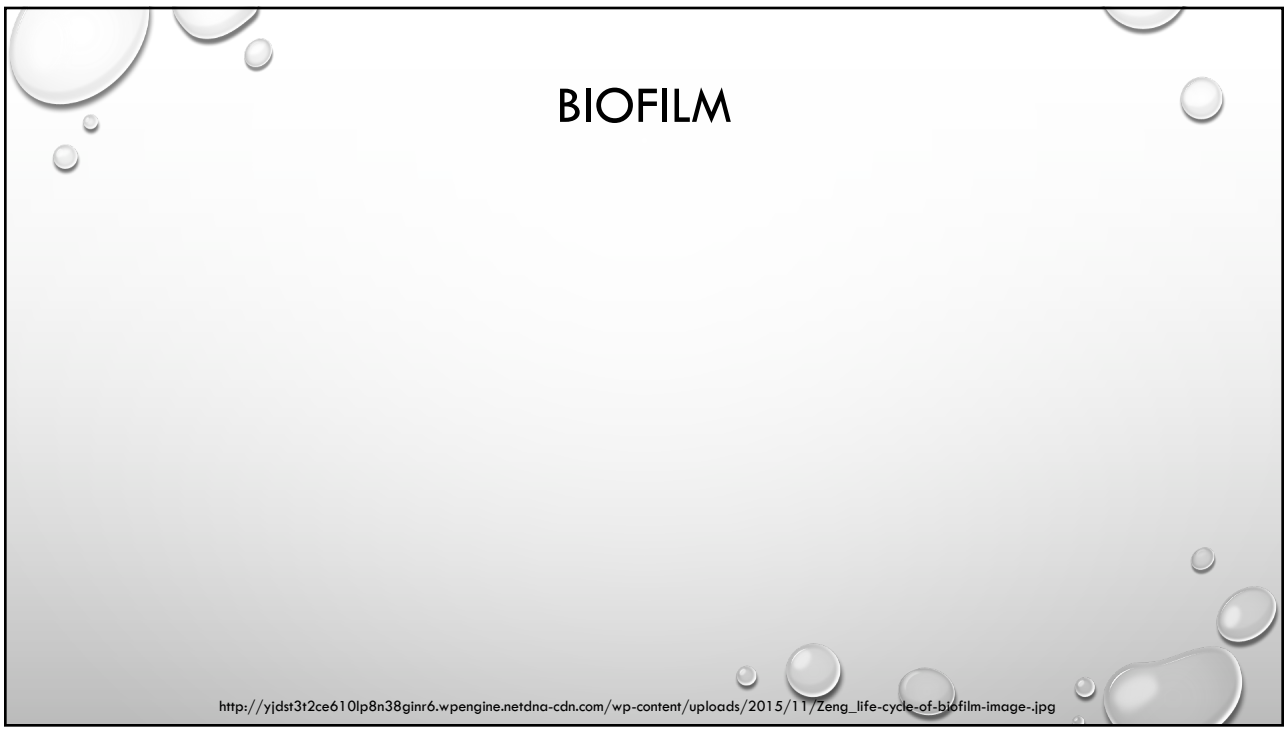
BIOFILM



http://yjdst3t2ce610lp8n38ginr6.wpengine.netdna-cdn.com/wp-content/uploads/2015/11/Zeng_life-cycle-of-biofilm-image-.jpg

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BIOFILM

- SOME STRAINS SPECIALIZED TO PRODUCE BIOFILMS
  - *STAPHYLOCOCCUS* SPP
  - *PSEUDOMONAS* SPP – 40% IN ONE STUDY
  - *MALASSEZIA* SPP

YOUNG CULTURES PRODUCE FEW BIOFILM! THE REASON WHY EVALUATION OF BIOFILM PRODUCTION IS NOT SO EASY.

IN CHRONIC PURURLENT OTITIS THE MAJORITY (MAY BE ALL) OF BACTERIAS PRODUCE BIOFILM!

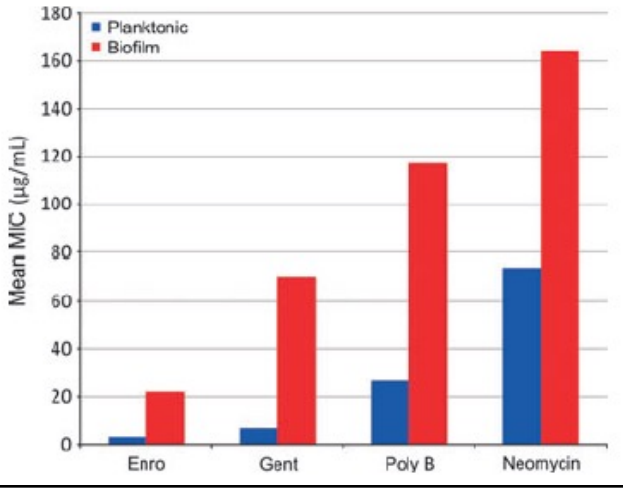
64

Vet Dermatol 2013 DOI: 10.1111/vde.12040

Evaluation of biofilm production by *Pseudomonas aeruginosa* from canine ears and the impact of biofilm on antimicrobial susceptibility *in vitro*

Charlotte C. Pye*, Anthony A. Yu† and J. Scott Weese‡

Drug	MIC range (µg/mL)	
	Planktonic	Biofilm
Enrofloxacin	1–16	1–256
Gentamicin	1–64	4–1024
Polymyxin B	1–256	2–256
Neomycin	8–256	8–1024



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BIOFILM PROTECTS THE ORGANISM

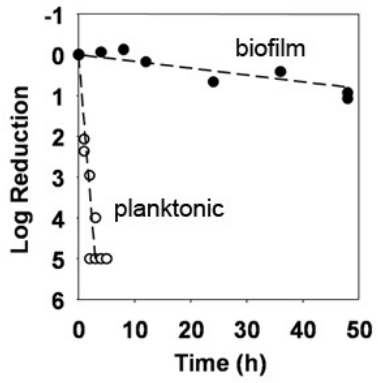

Figure 1. *S. epidermidis* killing by Rifampin.

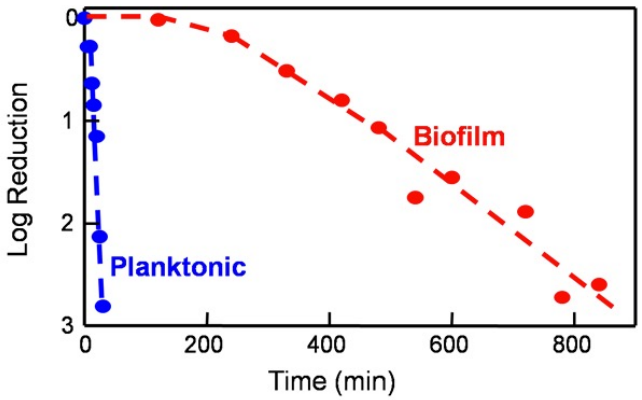

Figure 2. 50 mg/l Glutaraldehyde.

http://biofilmbook.hypertextbookshop.com

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BIOFILM TREATMENT

- TRIZEDTA
- N-ACETYLCYSTEINE
  - 2% SOLUTION
- SILVER
- GENTIAN VIOLET
- AGGRESSIVE FLUSHING

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CASE 4 - BRUNO

- NON-RESPONSIVE TO CURRENT THERAPY
  - CLARO (FLORFENICOL), ENROFLOXACIN
- WHAT BACTERIAL ORGANISM? PSEUDOMONAS?
- SUSCEPTIBILITY TESTING
- COMPOUNDED EAR MEDICATION?

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Determination of enrofloxacin stability and *in vitro* efficacy against *Staphylococcus pseudintermedius* and *Pseudomonas aeruginosa* in four ear cleaner solutions over a 28 day period

Catherine A. Metry*, Carol W. Maddox†, Levent Dirikolu‡, Yvette J. Johnson* and Karen L. Campbell*

Abstract

Chemical stability and *in vitro* bactericidal efficacy of 0.9% enrofloxacin-compounded solutions were evaluated following storage at room temperature for 28 days. Chemical stability of enrofloxacin was determined by high-performance liquid chromatography (HPLC) in five compounded solutions, including sterile water. Bactericidal efficacy was determined by spiral plating serial 10-fold dilutions of bacteria and solutions followed by colony counts. Tris–EDTA [TrizEDTA® (TE)], Tris–EDTA and 0.15% chlorhexidine [TrizChlor® (TC)], 2.5% lactic acid, 0.1% salicylic acid and 0.1% parachlorometaxylenol [Epi-Otic (EO)], and 0.1% free salicylic acid, 0.1% parachlorometaxylenol and 0.5% EDTA [Epi-Otic Advanced (EA)] were used. High-performance liquid chromatography was carried out with one-step liquid/liquid extraction to detect and quantify enrofloxacin stability. Mean recoveries for compounded samples run in triplicate at 28 days were 97.7% (TE), 99.9% (TC), 98.1% (EO) at 28 days were 97.7% (TE), 99.9% (TC), 98.1% (EO) and 97.8% (EA). Kruskal–Wallis analysis showed no significant difference in the percentage recovery ($H = 0.0539$, df = 3, $P = 0.9967$). American Type Culture Collection strains of *Staphylococcus pseudintermedius* and *Pseudomonas aeruginosa* were used to evaluate *in vitro* efficacy following 30 min incubation on days 0, 14 and 28. Consistent *in vitro* bactericidal efficacy of all compounded solutions, indicated by killing >2.3×10^7 colony-forming units/mL, was seen; however, bactericidal efficacy decreased for compounded TC on day 14. *Pseudomonas aeruginosa* was more sensitive to the ear cleaners and enrofloxacin than *S. pseudintermedius*. The HPLC and *in vitro* data suggest that 0.9% enrofloxacin compounded with sterile water, TE, EO and EA maintains chemical stability and bactericidal efficacy for 28 days.

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Staphylococcus pseudintermedius

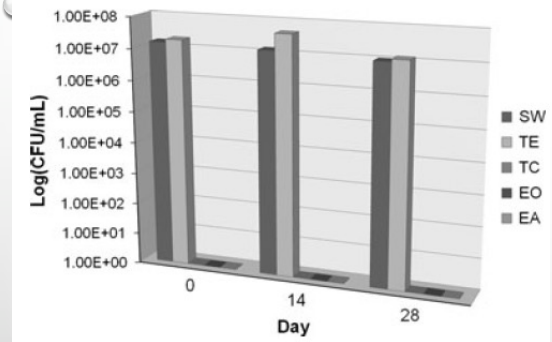

Figure 1. *Staphylococcus pseudintermedius* survival following 30 min contact time with ear cleaners alone. Abbreviations: SW, Sterile water; TE, TrizEDTA; TC, TrizChlor; EO, Epi-Otic; and EA, Epi-Otic Advanced. Data are based on the 1:25 dilution of the cleaners.

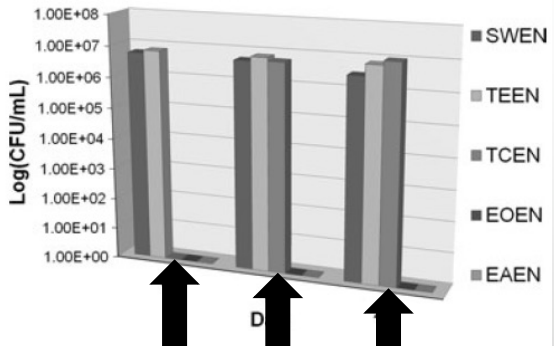

Figure 2. *Staphylococcus pseudintermedius* survival following 30 min contact time with 0.9% enrofloxacin-compounded ear cleaners. Abbreviations are as in the legend to Figure 1. Data are based on the 1:25 dilution of the cleaners.

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CASE 4 - BRUNO

- NON-RESPONSIVE TO CURRENT THERAPY
  - CLARO (FLORFENICOL), ENROFLOXACIN
- WHAT BACTERIAL ORGANISM? PSEUDOMONAS?
- SUSCEPTIBILITY TESTING
- COMPOUNDED EAR MEDICATION?
- LONG TERM PREVENTION

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VETERINARIANS DISCUSS UNDERLYING ALLERGY

21.1X

Veterinarians are 21.1x more likely to discuss "allergy"

- *Most ear infections are secondary to an allergy, but the cause seems to be missing from many pet owner conversations*

> I have a 7 - 8 yr old Im Gsd with bad allergies that gave him horrific ear infections. I got him a lot better with a diet change to grain free, a month of cephalexin, a short course of pred and he's currently on hydroxyzine. did 2 rounds of Claro for his poor bleeding ears. o reports he's much improved but he still has some purulent drainage from his one ear. they don't have a lot of money

> recurrent yeast infection(and most recurrent bacterial infecti ons), is allergy until proven otherwise. if recurrence is independe nt of season, like you I start with food which you report has helpe d some so might take longer or could be seasonal in addition to f ood.

> *I proceeded to educate her on all the differential diagnoses of this recurrent otitis. she didn't really like any of my explanations or recommendations. she settled for letting my nurse clean Zelda's ears in the room wit...*

> @JKotie15 I'm sure we're on the same page regarding animal welfare; you obviously are an animal lover too. the overwhelming cause of aural haematomas in non- fighting dogs is otitis externa secondary to skin allergies . 1/2

> my long way of saying- please don't talk about surgery before addressing all possible allergies .

> @snej2798 it otitis externa and the bloody spots are where the dog has scratched or rubbed. could be caused by yeast, bacteria, ear mites, allergies ... etc. pretty common, but sometimes difficult to treat and prevent depending on cause.

Virbac Shaping the future of animal health

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A study to evaluate the primary causes associated with Pseudomonas otitis in 60 dogs

S. Paterson[1] and W. Matyskiewicz

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[1]Corresponding author email: spatersonvetmb1959@btinternet.com; vet.pat@nildram.co.uk

Objectives: To evaluate the primary causes, age of onset and time from diagnosis of otitis to development of Pseudomonas otitis in each case.

Materials and Methods: Data from clinical records of 60 dogs were extracted to address the study objectives. Pseudomonas otitis was diagnosed by clinical signs and positive culture.

Results: In total, 57 purebred dogs and three crossbreed dogs were included: 32 dogs had unilateral and 28 bilateral disease. Underlying primary causes of otitis were allergy (42), masses (8), endocrine disease (7) and autoimmune disease (3). The mean age of onset of otitis (and subsequent time to development of Pseudomonas otitis) in dogs with allergic otitis was 40 months (28 months), with endocrine disease was 56 months (19 months) and masses 99 months (10 months).

Clinical Significance: The most common primary causes of otitis in dogs with Pseudomonas infections are, in decreasing frequency: allergies, masses, endocrine disease and autoimmune disease. Secondary infections with Pseudomonas developed more quickly if there was a mass or autoimmune disease, as compared with allergies and endocrinopathies.

Journal of Small Animal Practice (2018) **59**, 238–242
DOI: 10.1111/jsap.12813

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Table 2. Mean age of onset of first episode of otitis and time to first episode of Pseudomonas otitis in each primary cause group and in the three most common breeds

Primary cause of otitis	Mean age of onset of first episode of otitis in months (years and months) in all dogs		Time between first case of otitis and Pseudomonas otitis in months (number of cases in each group)							
			All dogs		Cocker spaniel		Labrador retriever		Basset hound	
Allergy	40	(3 years 4months)	28	(42)	34	(14)	19	(6)	10	(4)
Endocrine	56	(4 years 8months)	19	(7)	4	(1)	30	(1)	8	(1)
Mass	99	(8 years 3months)	10	(8)	4	(2)	20	(1)	13	(1)
Autoimmune	39	(3 years 3months)	8	(3)		(0)		(0)		(0)

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ADDRESS UNDERLYING CAUSE!

- Atopic dermatitis
  - Apoquel®
  - Cytopoint®
  - Zenrelia™?

  → Anti-Pruritic
  - Glucocorticoids
  - Cyclosporine
  - Immunotherapy

  → Anti-Inflammatory
- Adverse food reaction

75

CASE 4 - BRUNO

- EPI-OTIC ADVANCED EAR CLEANING ONCE WEEKLY
- COMPOUNDED AMIKACIN/DEXAMETHASONE SOLUTION DAILY FOR 4 WEEKS
- CHANGE TO CYCLOSPORINE AND DISCONTINUE APOQUEL AFTER 6 WEEKS

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SUMMARY

- OTITIS IS A SECONDARY DISEASE IN THE MAJORITY OF CASES
- TREATMENT SHOULD BE INDIVIDUALIZED
  - EASE OF APPLICATION
  - DECREASE CAREGIVER BURDEN
- NEED TO BE PROACTIVE AND ADDRESS UNDERLYING CAUSES OF OTITIS TO PREVENT RECURRENT OTITIS EXTERNA

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QUESTIONS?

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