

Is Topical or Systemic Antimicrobial Therapy More Effective for the Treatment of Feline Acne With Secondary Bacterial Infection?

A Knowledge Summary by

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PICO question

In cats with feline acne and secondary bacterial folliculitis or furunculosis, is topical or systemic antimicrobial therapy superior for reducing time to resolution and severity of clinical signs?

Clinical bottom line

There is no sufficient evidence to compare topical versus systemic treatment in feline acne with secondary folliculitis/furunculosis.

Clinical scenario

A five-year-old male neutered Persian indoor cat presents with crusting, comedones, erythema and alopecia of the chin. Deep skin scrapings are negative for ectoparasites and cytology of superficial scrapings shows intracellular cocci and neutrophils. The owner declines culture and sensitivity testing due to financial restrictions. Should the patient be treated with topical and/or systemic antimicrobials?

The evidence

Evidence found was made up of a prospective open-label trial and a retrospective descriptive study based on medical records, both with low ranking in the hierarchy of evidence. No randomised case-control studies or experimental studies comparing topical to systemic antimicrobial treatment were found.

Summary of the evidence

White <i>et al.</i> (1997)	
Population:	Owned cats presenting to 5 veterinary dermatology referral centres with a clinical diagnosis of feline acne (comedones, crusts and or nodules on chin) and without any treatment in the month prior to examination at referral
Sample size:	25 cats (mean 5.4 years, range 0.5-16 years, 10 male neutered, 3 male entire, 8 female spayed, 4 female entire)
Intervention details:	Non-randomised treatment groups, owners of all cats instructed to topically apply 2% mupirocin ointment to chin lesions twice a day for 3 weeks
Study design:	Prospective open-label trial
Outcome studied:	Percentage of lesions resolved following topical treatment with 2% mupirocin and subjective scoring of the change of severity of lesions remaining

Main findings: (relevant to PICO question):	<ul style="list-style-type: none"> • Response to treatment was graded from excellent (90-100% resolution of clinical signs), good (50-90% resolution of clinical signs) and fair (<50% but some resolution noted) • The severity of lesions in the study population was uncertain, as criteria for severity such as the presence of draining tracts, severe nodules or fistulae were not included in the grading system • After three weeks of treatment, 12 of 25 cats were graded as having an excellent response and of these, 2 resolved completely. • The remaining 12 cats were graded as having a good response to treatment. • Of the cats classed as having a good response, 4 received a further three weeks of treatment. Of these, 3 had an excellent response and 1 maintained a good response • The majority of cases were only evaluated at one time point after three weeks of treatment, which is insufficient to evaluate duration of treatment effect. Four cats were followed up again three weeks later following an extended treatment course.
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Limitations:	<ul style="list-style-type: none"> • There was no explicit comparison of topical to systemic antibiotics • No systemic drugs were used in study • Small number of cases • Recruitment of the cohort was not randomised, not controlled and not necessarily representative of the population • No control group • Culture and sensitivity testing was not performed to confirm the diagnosis of secondary bacterial infection • The grading system was subjective and not accurately measured to limit bias (although the authors tried to maintain consistency by having the same clinician evaluate cases before and after treatment) • Inter-rater agreement was not measured and there was no corroboration with another clinician • Clinical severity of feline acne in the study population could not be accurately assessed as there were no criteria for differentiating between furunculosis and folliculitis included in the grading system • Confounding factors include potential antifungal properties of mupirocin, which were discussed but not investigated • Different assessing criteria from different centres • Treatment of 1 cat was stopped due to contact dermatitis
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Scott and Miller (2010)	
Population:	74 feline patients with feline acne, 31 of which were diagnosed with secondary bacterial folliculitis or furunculosis at Cornell University Hospital for Animals between 1988-2003
Sample size:	31 cats (female spayed 54.1%, male neutered 35.1%, female entire 6.8%, male entire 4%)
Intervention details:	Cats with a diagnosis of feline acne and secondary bacterial folliculitis or furunculosis and were treated with systemic and/or topical

	antimicrobials. Topical antibiotics used included benzoyl peroxide, chlorhexidine, mupirocin Systemic antibiotics used included amoxicillin clavulanate, cefadroxyl, clindamycin, tylocin. The numbers of cats receiving each treatment type were not specified.
Study design:	Retrospective descriptive study based on medical records
Outcome studied:	Resolution of secondary bacterial infection Follow up information (range: 2 months - 10 years) was evaluated for 28 of 31 cats
Main findings: (relevant to PICO question):	<ul style="list-style-type: none"> • All cats responded to antimicrobial therapy (but this was not quantified or further described) • All cases responded to either topical or systemic treatment or a combination of both • All cats had persistent comedonal disease which remained post treatment • Only 2 cats were known to relapse and topical mupirocin was used in these 2 cats for 2-4 years to prevent recurring infections. Dosage was not specified by the authors.
Limitations:	<ul style="list-style-type: none"> • The outcome studied was poorly defined • There was no explicit comparison of topical versus systemic antimicrobial treatment • Assignment of treatment type according to clinical severity was unknown • The cohorts for each treatment type (systemic, topical, or both) were not clearly defined • No control group • The time to resolution, antimicrobial(s) used, doses and metrics for measuring response were not detailed (apart from mentioning that all cases resolved), so it is not possible to evaluate whether topical or systemic antimicrobial treatment was more effective • The comedones or furuncles were not cultured and the diagnosis of secondary bacterial infection was based on cytology

Appraisal, application and reflection

The purpose of this Knowledge Summary was to evaluate whether topical or systemic antimicrobial treatment was more effective for reducing time to resolution and severity of clinical signs in feline acne patients with secondary bacterial infection.

No controlled clinical studies or experimental studies were found directly comparing the effect of topical to systemic antimicrobial treatment. The two studies found included no control groups. Both studies indicated positive response to treatment. However, both were low in the hierarchy of evidence and did not provide evidence to enable comparison of the use of topical, systemic or combined antimicrobial treatments.

The prospective open-label trial evaluating the effect of topical 2% mupirocin for the treatment of bacterial folliculitis or furunculosis secondary to feline acne (White et al. 1997) indicates that this regimen reduces clinical signs by at least 50% for most treated cats immediately following a three-week treatment course. However, cases were not followed up further and may have required ongoing or recurrent treatment. Two of 25 cats had full resolution of clinical signs following three weeks of treatment. No control group was included,

and consideration must be given to the potential for spontaneous resolution. The severity of lesions in the study population was uncertain, as criteria for severity such as the presence of draining tracts, severe nodules or fistulae were not included in the grading system. The study population may have had relatively mild feline acne for which topical 2% mupirocin treatment was sufficient to alleviate clinical signs. However, topical 2% mupirocin may or may not be as effective in patients with severe furunculosis. There was no comparison of topical and systemic antimicrobial treatments.

The retrospective descriptive study (Scott and Miller 2010) also did not compare topical and systemic antimicrobial treatments. No distinction was made between treatment groups. Cats with secondary bacterial folliculitis or furunculosis were successfully treated with systemic and/or topical antimicrobials. A good clinical response was not defined. However, comedones persisted in all cases even with resolution of secondary infection. Selection of treatment for cats may or may not have been influenced by disease severity and is unknown. Consequently, there is insufficient evidence to indicate resolution of moderate/severe clinical signs following treatment. Cats with more severe lesions may have been more likely to have received systemic or combined systemic and topical antimicrobial treatment. Therefore, there is insufficient evidence for comparison of the efficacy of these treatments.

In conclusion, topical 2% mupirocin ointment appears to be effective in the treatment of bacterial infection secondary to feline acne. However, the severity of cases was not graded and therefore can only provide evidence for efficacy of topical 2% mupirocin ointment for treatment of mild cases of feline acne with secondary bacterial infection. The strength of evidence was weak and this structured evidence review was therefore unable to draw firm conclusions. A high-quality randomised controlled trial is necessary to help answer this question.

Methodology Section

Search Strategy	
Databases searched and dates covered:	CAB Abstracts (1973 – Week 5 2017), PubMed (all years – Week 23 2017)
Search terms:	(cat or cats or feline or felines or felis) AND (Antibiotic or antibiotics or antimicrobial or antimicrobials or anti-microbial or antimicrobials or antibacterial or antibacterials or 'antiinfective agent' or 'antiinfective agents' or 'anti-infective agent' or anti-infective agents') AND ('feline pyoderma' or 'feline chin acne' or 'feline acne' or 'chin acne' or 'bacterial pyoderma' or 'superficial pyoderma' or 'bacterial folliculitis' or 'bacterial furunculosis')
Dates searches performed:	15 th February 2017 (CAB Abstracts) and 5 th June 2017 (PubMed)

Exclusion / Inclusion Criteria	
Exclusion:	Articles not available in English, articles not relevant to the question, duplicates
Inclusion:	Articles in English and relevant to the question

Search Outcome				
Database	Number of results	Excluded – non-English language publication	Excluded – Not relevant to question	Total relevant papers
CAB Abstracts	84	18	64	2
NCBI PubMed	26	1	25	0
Total relevant papers when duplicates removed				2

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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