

Efficiency of sanitary wipes impregnated with chlorhexidine digluconate, climbazol, zinc gluconate, tris-EDTA and glicerine in the treatment of *Malassezia dermatitis* in dogs

Authors of the clinical study:
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Composition:

- Chlorhexidine digluconate 0,3%
- Climbazol 0.5%
- Zinc gluconate 1%
- TrisEDTA solution
- Glycerin

Zinc Gluconate, has high lenitive properties. It forms a protective layer on the skin and is an excellent barrier; protecting the skin from moisture, while encouraging the natural regeneration process.

Chlorhexidine is a bis biguanide, with high basic feature and is commonly used like digluconate. It's an antiseptic with very high biocide and biostatic activity toward some microorganism (*Gram+* and *Gram-* bacteria, yeasts, dermatophytes and lypophilus virus). Chlorhexidine acts very quickly even there are interfering substances and has an excellent residual activity. Beside, it has antimicrobial activity higher then other common antiseptics (e.g. iodine povidone and esaclorofene).

Chlorhexidine is effective against *Gram +* and *Gram -* bacteria, because it interfere with superficial structures of cell wall and induces the plunging of intracitoplasmatic contains. Bactericidal action is due to the destruction of the membrane of the bacterial cell, which leads to the death of microorganism.

Climbazole is a very well known antifungal molecule. It doesn't alter physiological integrity of the skin and prevents the overgrowth of yeasts like *Malassezia spp.* It has also antibacterial action and regulates turnover of the cells.

Tris EDTA, Ethylenediaminetetraacetic acid is a chelating agent, it has bactericide action through three mechanisms of action and notably on *Gram -* bacteria.

1. it binds metal ions (Mg^{++} , Ca^{++}) and altering bacterial membrane permeability;
2. it alters the ribosome stability;
3. it activates bacterial autolysin.

Chlorhexidine and tris-EDTA buffer have synergistic effect: buffering action of tris-EDTA stabilizes pH to 7,5-8,5 and allows chlorhexidine to exist in its most active form.

Glycerine, is a moisturizing agent that protect the skin.

Purpose of the study

The aim of this study was to evaluate the efficacy of sanitary wipes (sanitary wipes impregnated with chlorhexidine digluconate, climbazol, zinc gluconate, tris-EDTA and glicerine, ICF Cremona, Italy) impregnated with chlorhexidine digluconate, climbazol, zinc gluconate, TrisEDTA and glicerine, against *Malassezia pachydermatis* in naturally infected dogs (clinical studz of 15 cases).

Introduction

Malassezia pachydermatis is thick-walled, ovoid to ellipsoid, lipophilic, non-lipiddependent, nonmycelial yeast. It is usually found on skin, in ear canals, on mucosal surfaces, and in the anal sacs and vagina of normal dogs and cats. Changes in the microclimate of the skin or in the host defense mechanism allows these yeast to multiply in excessive number and becomes a pathogen. An overgrowth of *Malassezia* is usually associated with underlying disease such as hypersensitivity diseases (especially atopy), keratinization defects, recurrent bacterial pyodermas, and endocrine diseases (hypothyroidism).

The most common clinical sign of *Malassezia* dermatitis in dogs is moderate to intense pruritus. Localized or generalized alopecia, erythema, excoriations, greasy or waxy seborrhea are present on the affected skin. In chronic cases hyperpigmentation and lichenification can occur, and offensive rancid or yeasty odor.

Cytological examination is the most useful technique for identification *M. pachydermatis* overgrowth on the affected skin. For mild cases topical therapy is usually effective, but severe cases requires systemic antifungal therapy.

Material and methods

Fifteen client owned dogs, living in household, with localized *Malassezia* skin infection, were recruited from the Dermatology ambulance at the Faculty of Veterinary Medicine, University of Belgrade, Serbia.

The age of the animals were between 1.5 years and 10 years, and females were represented in a slightly higher percentage.

The most common were following breeds: English bulldog (8), pug (3), and one Shar-Pei,

French bulldog, dachshund and Dogo Argentino. Alopecia, erythema, excoriations, hyperpigmentation, lichenification, discharge and unpleasant odor were observed on the skin of affected dogs. These changes in bulldogs were present in nasal and tail fold, and in other breeds in the axillary region, ventral neck and interdigitally. Alopecia, excoriation, lichenification and erythema were evaluated by researchers at day 0, 14 and 28, with following numerical scale proposed in CADESI-4 lesion grading atlas:

- 0 none**
- 1 mild**
- 2 moderate**
- 3 severe**

All infected animals showed a different degree of pruritus. Population of *Malassezia* yeast were determined by cytology using the tape-strip technique. Each sample was stained using Diff Quik® and placed on a glass slide for microscopical examination. Ten random fields, were examined using the oil immersion objective (×1000). The total number of yeast organisms found in 10 random oil-immersion fields was counted. Medium count was obtained by dividing the total number of yeasts with 10.

Wipes were applied twice daily (morning and evening) to the affected skin. One wipe was scrubbed on each area for 30 s.

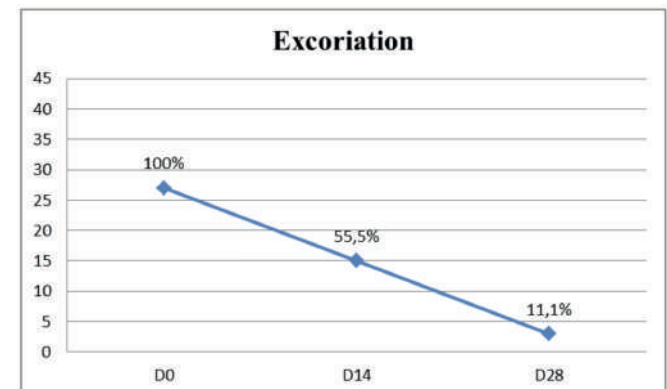
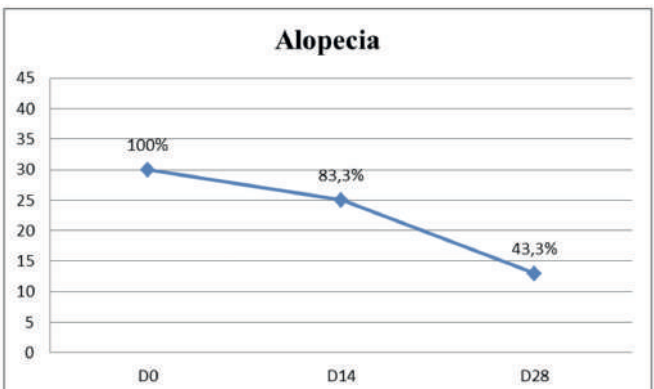
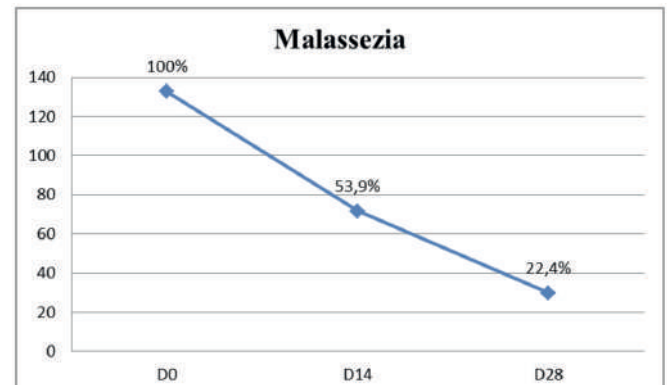
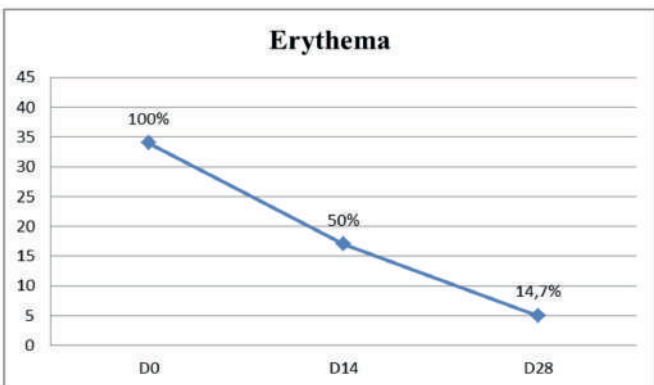
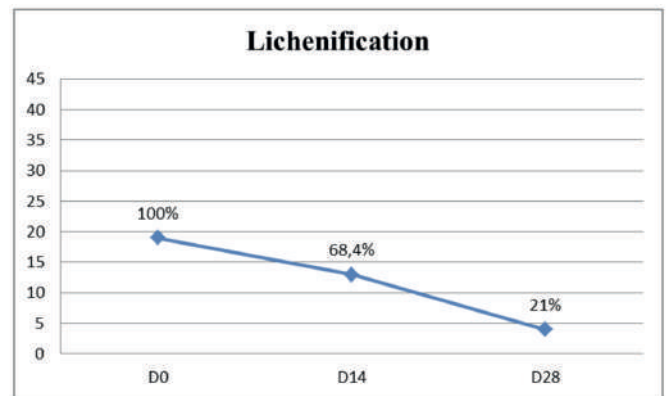
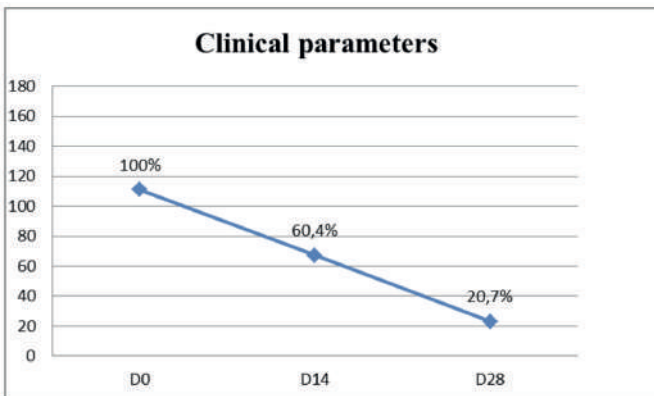
On the second control visit, the owners filled a questionnaire with the following questions: Wipes was easy to use, moderately easy or difficult to use? The product was effective, moderately effective or not effective?

Do you have any objection?

Number	Canine breed	Age	Sex	Erythema	Lichenification	Excoriation	Alopecia	Score	Malassezia	
Case 1	English bulldog	2	f	D0	2	1	2	2	7	8,3
				D14	1	0	1	1	3	3,2
				D28	0	0	0	1	1	1,4
Case 2	English bulldog	2	f	D0	3	0	3	2	8	9,6
				D14	1	0	1	1	3	4,2
				D28	0	0	0	1	1	2,4
Case 3	French bulldog	8	f	D0	3	1	2	1	7	6,7
				D14	1	1	1	1	4	2,8
				D28	1	0	0	1	2	0,8
Case 4	English bulldog	7	m	D0	2	0	2	1	5	5,6
				D14	1	0	1	1	3	2,8
				D28	0	0	0	0	0	1,6
Case 5	Pug	3	f	D0	3	3	1	3	10	11,2
				D14	1	2	0	2	5	5
				D28	0	1	0	1	2	2,2
Case 6	Pug	3	f	D0	0	2	1	2	5	6,3
				D14	0	1	1	2	4	2,9
				D28	0	1	1	1	2	1,5
Case 7	English bulldog	5	f	D0	2	1	2	2	7	7,3
				D14	1	1	1	2	5	3,8
				D28	1	0	1	1	3	1,9
Case 8	English bulldog	6	m	D0	3	0	2	3	8	9,3
				D14	2	0	1	2	5	4,9
				D28	0	0	0	0	0	0,5
Case 9	Dachshund	6	m	D0	2	3	2	2	9	8,7
				D14	1	2	1	1	5	4,4
				D28	1	0	0	1	2	1
Case 10	English bulldog	3	m	D0	3	0	3	3	9	12,3
				D14	2	0	2	2	6	7,6
				D28	0	0	0	1	1	2,8
Case 11	Pug	2	m	D0	3	1	1	1	6	7,5
				D14	1	0	0	1	2	4,2
				D28	0	0	0	0	0	0,9
Case 12	Dogo Argentino	8	f	D0	1	2	1	3	7	8,4
				D14	0	1	0	2	3	4,6
				D28	0	0	0	1	1	1,4
Case 13	Shar-Pei	6	f	D0	3	1	2	1	7	9,8
				D14	2	1	1	1	5	5,6
				D28	0	0	0	1	1	1,7
Case 14	English bulldog	3	m	D0	2	2	1	3	8	13,2
				D14	2	2	2	3	9	11,6
				D28	1	1	1	2	5	7,8
Case 15	English bulldog	3	m	D0	2	2	2	2	8	8,6
				D14	1	1	1	2	5	4,1
				D28	1	0	0	1	2	1,8

Results

All dogs showed significant improvement of clinical symptoms: erythema, excoriation, hyperpigmentation and lichenification of the skin was reduced or completely withdrawn, level of pruritus decreased, unpleasant odor disappeared, and hair regrowth was noticed.



The clinical parameters improved by 39.6% on D14 and by 79.3 % on D28. After 2 weeks, most prominent reduction was observed in erythema (50%) and excoriation (44.5%). After 4 weeks there was a further improvement in all clinical parameters: erythema was reduced 86.3%, excoriation 88.9%, lichenification 79% and alopecia 56.7%. At the first control visit number of *Malassezia* yeast on the affected skin was reduced by 46.1 %, and on the second by 77.6 % compared to the first examination.

Owners of the dogs gave a positive assessment to all questions, they were very satisfied with their effect (~90%), and convenient application (100%). They did not have any objections. In all cases no adverse reaction has been reported.

Conclusion

Malassezia dermatitis is very common in dogs, and changes on the skin can be localized or generalized. Local infection is usually present in axillary region, ventral neck, interdigital skin and intertriginous area that are warm and moist. The dermatitis often begins in the summer or highly humid months, and then persists into winter. Most of the dogs have concurrent disease, usually allergies, keratinization defects, endocrinopathies, and pyodermas.

This study showed that the application of sanitary wipes impregnated (with chlorhexidine digluconate, climbazol, zinc gluconate, tris-EDTA and glicerine) twice a day, was very effective in reducing the localized skin lesions due to increased population of *Malassezia pachydermatitis*. All clinical symptoms improved, pruritus decreased and unpleasant odor disappeared.

The compliance for this product was high, and based on the comments of the owner, wipes were easy for application and very effective.

Beside the therapeutical use of CLXwipes, they are very useful in the regular hygiene of difficult to reach areas, such as skin folds, interdigital space, perianal and perioral region.

Nasal fold in English bulldog



a D0

Moderate lichenification, erythema, excoriation, alopecia, great amount of yellowish exudate



b D14

Mild lichenification, erythema, small amount of yellowish exudate



c D28

Mild erythema, no exudate

Tail fold in English bulldog



Do

Severe erythema, excoriation and alopecia



D28

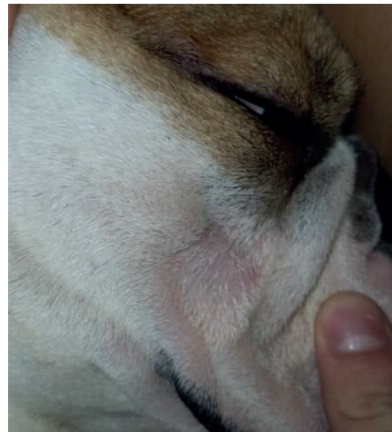
No erythema and excoriation, mild alopecia

Cheek fold and lip in English bulldog



Do

severe erythema and alopecia, moderate excoriation



D28

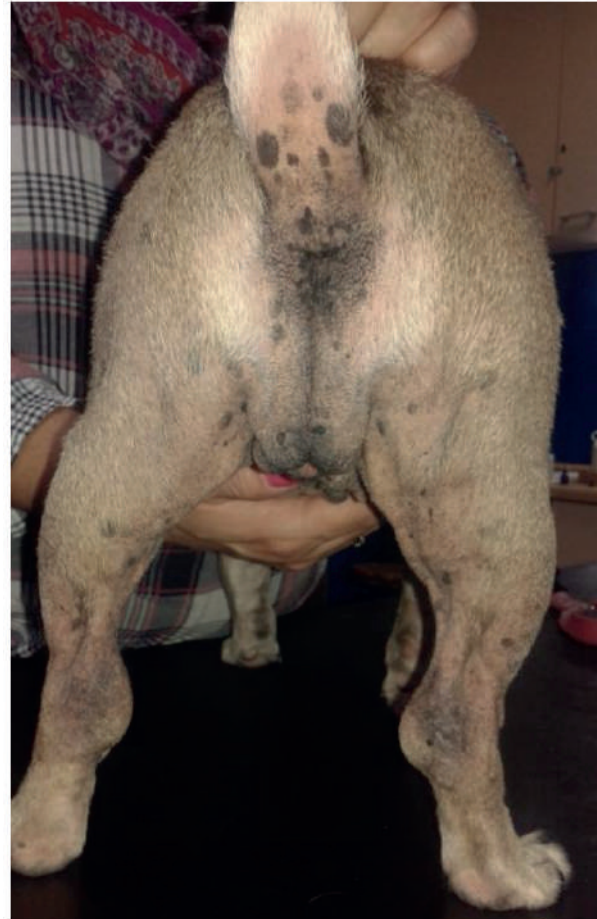
no erythema, alopecia and excoriation

Pug with atopic dermatitis and *Malassezia dermatitis*



Do

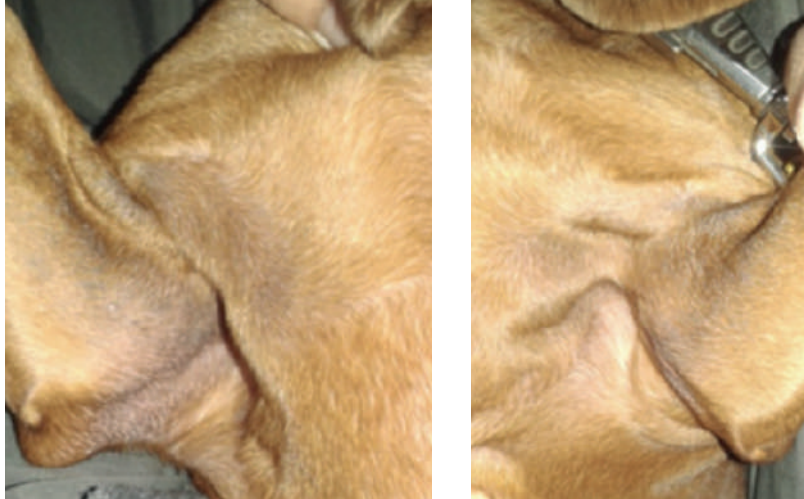
severe lichenification, erythema and alopecia



D28

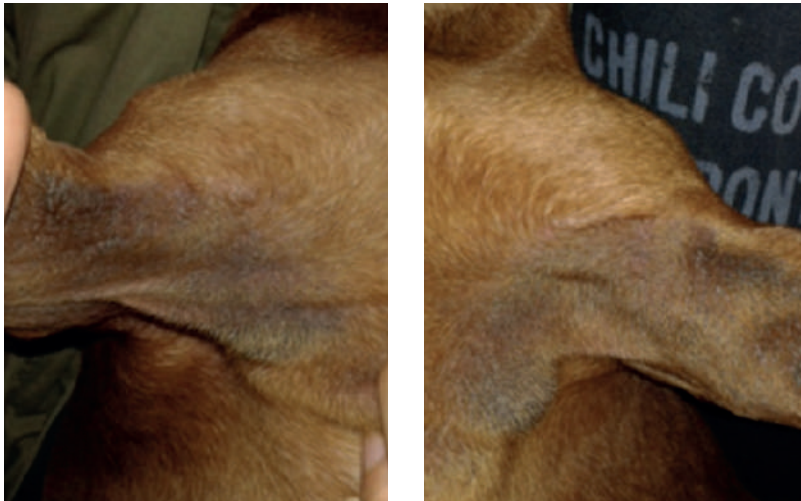
mild lichenification and alopecia

Axillary lesion in dachshund (left and right)



D28

Erythema and alopecia



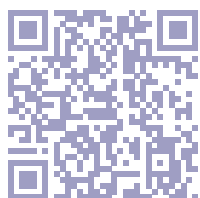
Do

Lichenification, erythema, excoriation and alopecia

Literature

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Paola Cavana, Andrea Peano, Jean-Yanique Petit, Paolo Tizzani, Sebastien Perrot, Emmanuel Bensignor and Jacques Guillot

A pilot study of the efficacy of wipes containing chlorhexidine 0.3%, climbazole 0.5% and Tris-EDTA to reduce Malassezia pachydermatis populations on canine skin.

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